

150  
A 077361  
July 79  
AFGL-TR-80-0261  
AIR FORCE SURVEYS IN GEOPHYSICS, NO. 430

12



LEVEL III

AD A 096772

## Cirrus Particle Distribution Study, Part 6

IAN D. COHEN, Capt, USAF  
ARNOLD A. BARNES, JR.

DTIC  
ELECTED  
MAR 24 1981

4 SEPTEMBER 1980

Approved for public release; distribution unlimited.

METEOROLOGY DIVISION PROJECT 317J  
AIR FORCE GEOPHYSICS LABORATORY  
HANSCOM AFB, MASSACHUSETTS 01731

AIR FORCE SYSTEMS COMMAND, USAF



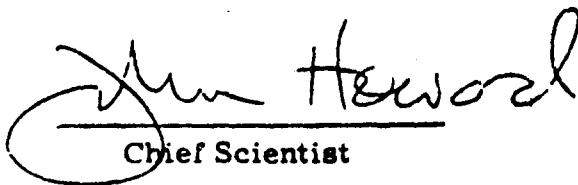
MC FILE COPY

81 3 24 025

This report has been reviewed by the ESD Information Office (OI) and is releasable to the National Technical Information Service (NTIS).

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER

  
Chief Scientist

Qualified requestors may obtain additional copies from the Defense Technical Information Center. All others should apply to the National Technical Information Service.

# ⑨ Air Force surveys in geophysics

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NO. AFGL-TR-80-021	2. GOVT ACCESSION NO. AD-A096 772	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) CIRRUS PARTICLE DISTRIBUTION STUDY. PART 6	5. TYPE OF REPORT & PERIOD COVERED Scientific. Interim.	
7. AUTHOR(s) Ian D. Cohen, Capt, USAF Arnold A. Barnes, Jr.	6. PERFORMING ORG. REPORT NUMBER AFSG No. 430	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Air Force Geophysics Laboratory (LYC) Hanscom AFB Massachusetts 01731	10. PROGRAM ELEMENT PROJECT, TASK AREA & WORK UNIT NUMBERS 36305F 317J0901	
11. CONTROLLING OFFICE NAME AND ADDRESS Air Force Geophysics Laboratory (LYC) Hanscom AFB Massachusetts 01731	12. REPORT DATE 4 September 1980	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) AFGL-TR-80-0262 AFGL-AFSG-430	13. NUMBER OF PAGES 106	
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution unlimited.	15. SECURITY CLASS (of this Report) Unclassified	
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Cirrostratus Sub-visible cirrus Particle distributions Cloud physics Tenuous clouds Cirrus		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Cirriform clouds associated with a frontal system which passed through New Mexico on 4 and 5 April 1978 were sampled by a MC-130E which has been equipped with cloud physics instrumentation by AFGL. The clouds sampled were thin cirrus and cirrostratus layers in advance of the front on 4 April and behind the same front on 5 April. Particle sizes were small; maximum sizes on 4 April were approximately 700 $\mu$ m. On 5 April, few clouds could be found, but one patch yielded particles as large as 1300 $\mu$ m. Particle distribution curves are presented for three 5-min periods from the 4 April flight and		

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

409578

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

20. (Cont)

one 5-min period from the 5 April flight. Additionally, consecutive 30-sec average distributions are presented for selected time periods from each of the flights. In addition to the visible cirrus clouds, particles were also found in clear air between the cirrus clouds. Some of the sub-visible cirrus particles seemed to come from clouds above the aircraft, but other instances of sub-visible cirrus occurred when there were no visible cirrus above the aircraft suggesting that the particles had developed in-situ.

A

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

## Preface

This report examines data obtained on two flights made by MC-130E S/N 640571. The authors appreciate the support of the aircrew and maintenance personnel of the 4950th Test Wing, Wright-Patterson AFB, Ohio. The diligent work of the work crew, headed by Capt Douglas Brooks and including MSgt James Bush, TSgt Marshall Wright, and SSgt Dennis LaGross, provided the necessary data and descriptions used in this report. Special thanks go to Lt Col Donald Varley for his helpful suggestions which aided in the writing of the report. The assistance of Ms. Barbara Main in preparing the illustrations, of Mrs. Pat Sheehy in typing the manuscript, and of James Lally of Digital Programming Services, Inc. (DPSI) in providing the computer printouts used in this report is greatly appreciated.

Accession For	
NTIS	GRA&I
DTIC TAB	
Unannounced	
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A	

## Contents

1. INTRODUCTION	7
2. SYNOPTIC SITUATION	9
3. THE FLIGHT	16
4. DISCUSSION OF DATA	19
5. SUB-VISIBLE CIRRUS	27
6. CONCLUDING REMARKS	31
REFERENCES	33
APPENDIX A: Transcript of Mission Director's Comments From the Flights of 4 and 5 April 1978	35
APPENDIX B: Selected 5-min Average Particle Distributions From the Flights of 4 and 5 April 1978	39
APPENDIX C: Selected 30-sec Average Particle Distributions From the Flight of 4 April 1978	43
APPENDIX D: Selected 30-sec Average Particle Distributions From the Flight of 5 April 1978	85
APPENDIX E: List of Abbreviations	105

## Illustrations

1. Sampling Areas of the Flights of 4 and 5 April 1978	8
2. Surface Analysis 1800Z of 4 April 1978	11
3. Surface Analysis 0900Z of 5 April 1978	11
4. Surface Analysis 1800Z of 5 April 1978	11
5. GOES Visible Satellite Photo 1830Z 5 April 1978	12
6. GOES Infrared Satellite Photo 1800Z 5 April 1978	12
7. 500 Millibar Analysis 1200Z 4 April 1978	13
8. 500 Millibar Analysis 0000Z 5 April 1978	13
9. 500 Millibar Analysis 0000Z 6 April 1978	13
10. 300 Millibar Analysis 1200Z 4 April 1978	14
11. 300 Millibar Analysis 0000Z 6 April 1978	14
12. Winslow Sounding 1200Z 4 April 1978	15
13. Albuquerque Sounding 1200Z 4 April 1978	15
14. Winslow Sounding 1200Z 5 April 1978	15
15. Albuquerque Sounding 1200Z 5 April 1978	15
16. Clouds at 29,000 ft at 1800Z on 4 April 1978	17
17. Clouds at 1828Z on 4 April 1978	17
18. Clouds at 1837Z on 4 April 1978	17
19. Cirrus Clouds at 1752Z on 5 April 1978	18
20. Cirrus Clouds at 1743Z on 5 April 1978	18
21. Altitude, Temperature, Ice Water Content, Medium Volume Diameter, and Particle Density for the Flight of 4 April 1978	21
22. Particle Size Distribution 1822Z to 1827Z 4 April 1978	22
23. Cirrus Clouds During the First Sampling Period on 4 April	23
24. Cirrus Clouds During the Second Sampling Period on 4 April	23
25. Particle Size Distribution 1836Z to 1841Z 4 April 1978	24
26. Particle Size Distribution 1856Z to 1901Z 4 April 1978	25
27. Particle Size Distribution 1836Z to 1841Z 5 April 1978	26
28. IWC and Cloud Cover vs Time for Flight of 4 April 1978	28
29. IWC and Cloud Cover vs Time for Flight of 5 April 1978	28
30. Particle Size Distribution 1842Z to 1844Z 5 April 1978	30

## Tables

1. Representative Surface Weather Observations 4 April 1978	10
2. Representative Surface Weather Observations 5 April 1978	10

## Cirrus Particle Distribution Study, Part 6

### 1. INTRODUCTION

This is the sixth in a series of reports on studies of cirriform clouds performed by AFGL for the Air Force Weapons Laboratory's Advanced Radiation Technology (ART) program. These reports discuss cloud microphysical data acquired by the MC-130 aircraft, tail number 640571, maintained and flown by crews of the 4950th Test Wing at Wright-Patterson AFB, Ohio.

Varley<sup>1</sup> discussed the AFGL-cloud physics instrumentation on this aircraft in a report which described the data obtained on the cirrus flight of 29 October 1977. That flight investigated a band of pre-frontal cirrus and cirrostratus clouds. A similar weather situation existed on 4 April 1978 during a flight which is described herein. Dyer and Barnes<sup>2</sup> discussed the C-130 instrumentation and summarized research in the area of ice crystals and snowflakes. In other reports, Varley and Brooks<sup>3</sup> and Cohen<sup>4</sup> reported on cirrus associated with stationary fronts east of the sampling area, and Varley<sup>5</sup> and Varley and Barnes<sup>6</sup> described the microphysical properties of non-frontal cirrus clouds sampled on 18 and 21 March 1978, respectively.

---

(Received for publication 3 September 1980)

(Due to the large number of references cited above, they will not be listed here. See References, page 33.)



The purpose of the flight of 4 April 1978 was to investigate the leading edge of a band of cirrus and cirrostratus which was associated with a frontal system to the west of a sampling area located in southern Colorado and northwestern New Mexico. During the 24 hr after the flight, the frontal system passed through the sampling area and began to intensify over the central United States.

A second cirrus flight was conducted on 5 April 1978 in western New Mexico and eastern Arizona. By this time, however, the frontal system had moved well east of Albuquerque and very little cloudiness remained. Since the data obtained on 5 April were associated with the same system, results of the 5 April flight are included in this report, thus providing data during both pre-frontal and post-frontal conditions.

The flights of 4 and 5 April originated and terminated at Kirtland AFB, Albuquerque, New Mexico. The sampling portion of the 4 April flight was conducted near Farmington, New Mexico, while that of 5 April flight was made near Gallup, New Mexico. Figure 1 shows these locations. During both flights the MC-130E climbed to an altitude of approximately 30,000 ft (9.7 km) MSL to obtain data on the cirrus and cirrostratus clouds there. In both cases cirrus clouds existed at higher levels, but the aircraft was unable to climb these clouds, which were estimated to extend to 35,000 ft (10.7 km). Terrain in the area varies from 4000 to 9000 ft MSL (1.2 to 2.7 km), thus the aircraft was generally 21,000 ft or more above the ground.

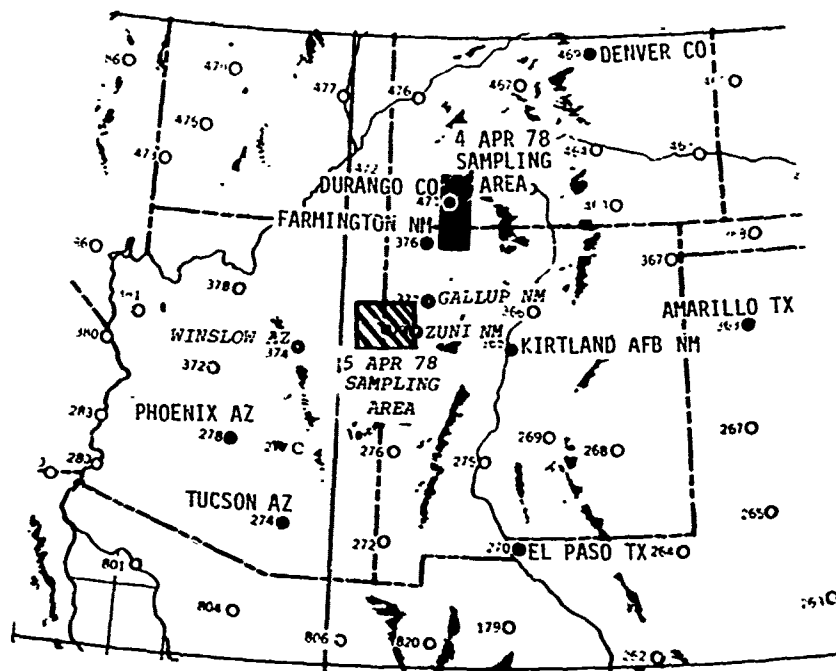


Figure 1. Sampling Areas of the Flights of 4 and 5 April 1978

Each flight provided approximately 75 minutes of data. On both days, much of this time was spent in clear air during which very few particles were detected. Almost all of the 5 April flight occurred in clear air. Sub-visible cirrus particles were detected on both flights.

## 2. SYNOPTIC SITUATION

On the morning of 4 April 1978 a frontal system extended parallel to the Pacific Coast from a low pressure center off the coast of British Columbia. At 1800Z on 4 April, the low was 100 nautical miles northwest of Vancouver, BC, and the frontal system extended through western Nevada and central California, as depicted in Figure 2. The low pressure area itself does not appear on Figure 2. Although there was a stationary front in the Texas Panhandle, its influence did not extend to western New Mexico. Rather, the visible cirrus observed on the flight spread from west to east as the front in California moved east. By 0900Z on 5 April, the front had arrived in the sampling area, as shown in Figure 3.

During the early morning of 5 April, the front continued eastward, and by 1800Z it had moved into eastern New Mexico, as seen in Figure 4. By 2100Z on that day, it had combined with the low pressure center in western Kansas and the warm front in eastern Kansas to form an open wave. As can be seen in the GOES visible and infrared satellite pictures of Figures 5 and 6, most of the cloud cover was in advance of this front, while only some thin, tenuous cirrus remained over northwestern New Mexico, appearing on the infrared photo (Figure 5).

The main part of the 500 millibar pattern consisted of a long wave trough off the West Coast. As Figures 7, 8, and 9 show, a short wave moved around that trough and by 0000Z on 5 April (Figure 8) was over Nevada and western Arizona. By 0000Z on 6 April (Figure 9) the short wave had moved to the Texas Panhandle where it was aiding the development of the surface low in Kansas. A similar pattern existed at 300 millibars (the level at which sampling was conducted) as shown in Figures 10 and 11.

Rawinsonde observations for Albuquerque, New Mexico and Winslow, Arizona are presented in Figures 12 through 15. Figures 12 and 13 present 1200Z (0500 MST) data for 4 April. At that time both Winslow and Albuquerque were in the warm, dry air mass ahead of the front. Both soundings show nocturnal inversions with that at Winslow being more pronounced. At Winslow, a second inversion at 3 km was probably a subsidence inversion associated with the high pressure ridge which had just passed. Figures 14 and 15 are for the same two stations at 1200Z (0500 MST) on 5 April. The front appears on the Winslow rawinsonde at a height of approximately 5 km. Both a temperature inversion and a wind shift were present at that

level, indicating a strong upper level frontal surface. At the time of the flights, however, the front aloft had little moisture as indicated by the large temperature/dew point spread and, as a result, little cloudiness. At Albuquerque at 1200Z on 5 April, a strong nocturnal inversion had developed near the surface, but at 1200Z, the front had not yet passed. Additionally, a thin layer of clouds at 6 km is indicated by an abrupt increase in dewpoint at that level.

Tables 1 and 2 show selected surface observations on 4 and 5 April 1978. On 4 April thin cirrus was reported throughout the New Mexico area, but there were thicker cirrus clouds reported in central and southern Arizona. On 5 April there were only occasional reports of thin cirrus in New Mexico and Arizona.

Table 1. Representative Surface Weather Observations 4 April 1978

Time (Z)	Location	Cloud Height and Extent (100s ft)	Temp (°F)	Dew Pt (°F)	Wind (Dir/kt)
1740	Durango, CO	200 Bkn (thin)	53	43	090/04
1800	Farmington, NM	200 Ovc (thin)	60	26	120/10
1800	Gallup, NM	250 Ovc (thin)	60	14	160/15
1800	Albuquerque, NM	Clear	66	24	270/14
1900	Farmington, NM	200 Ovc (thin)	63	18	270/04
1900	Gallup, NM	250 Ovc (thin)	60	14	160/15
1900	Albuquerque, NM	250 Ovc (thin)	71	22	220/14G18

Table 2. Representative Surface Weather Observations 5 April 1978

Time (Z)	Location	Cloud Height and Extent (100s ft)	Temp (°F)	Dew Pt (°F)	Wind (Dir/kt)
1800	Farmington, NM	50 Sct	47	27	280/15
1800	Gallup, NM	Clear	49	21	250/10G15
1800	Winslow, AZ	300 Bkn (thin)	51	24	230/05
1800	Phoenix, AZ	250 Sct (thin)	67	39	030/05
1800	Albuquerque, NM	75 Sct	58	21	260/11

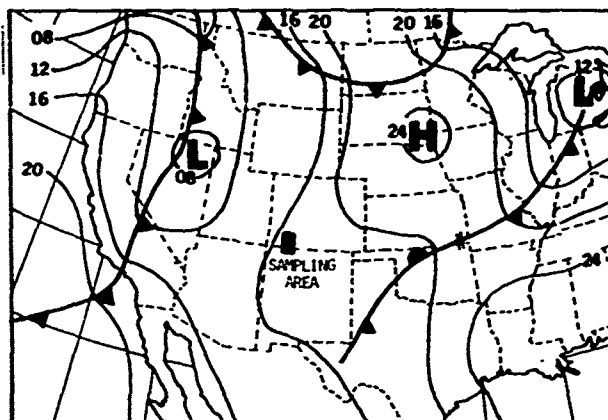


Figure 2. Surface  
Analysis 1800Z of  
4 April 1978

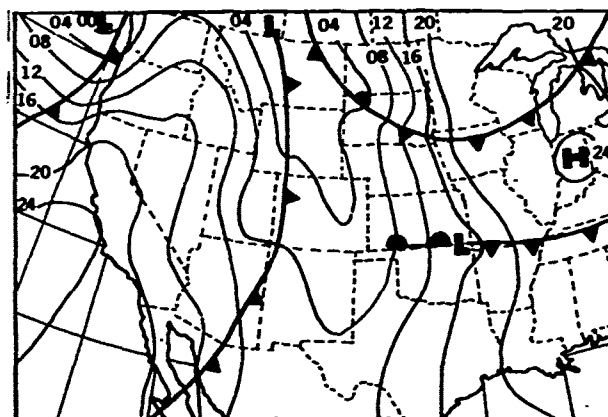


Figure 3. Surface  
Analysis 0900Z of  
5 April 1978

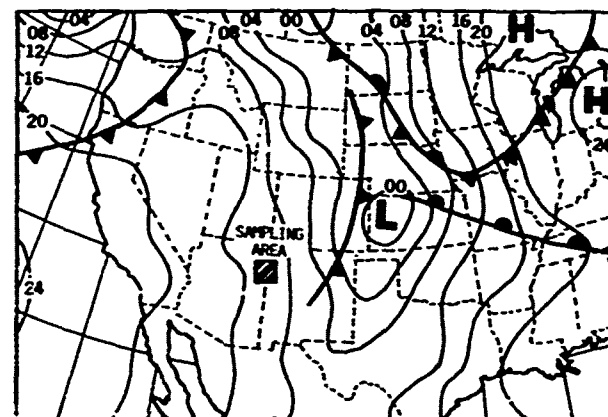


Figure 4. Surface  
Analysis 1800Z of  
5 April 1978

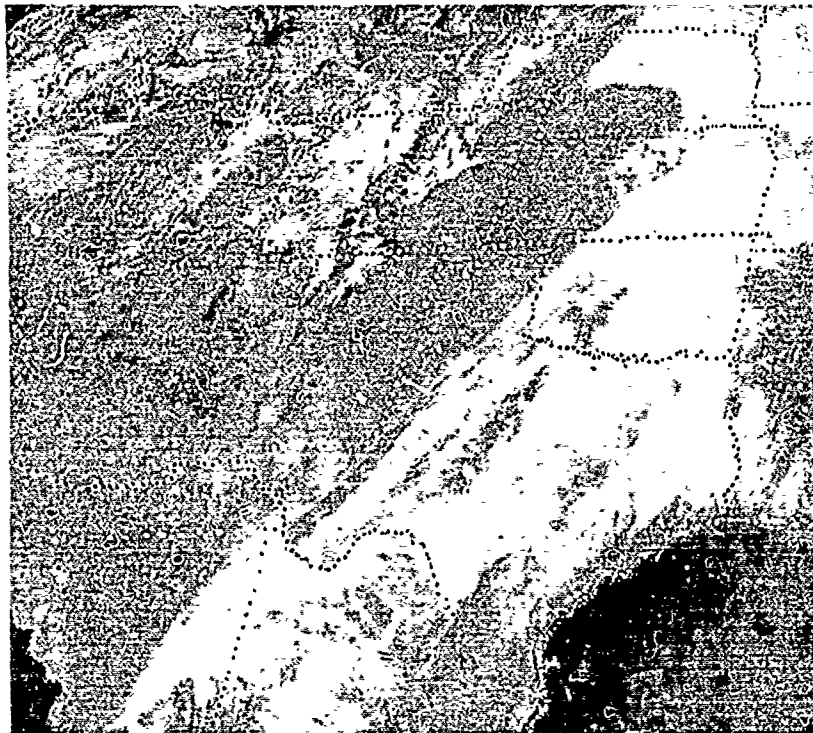


Figure 5. GOES Visible Satellite Photo 1830Z 5 April 1978

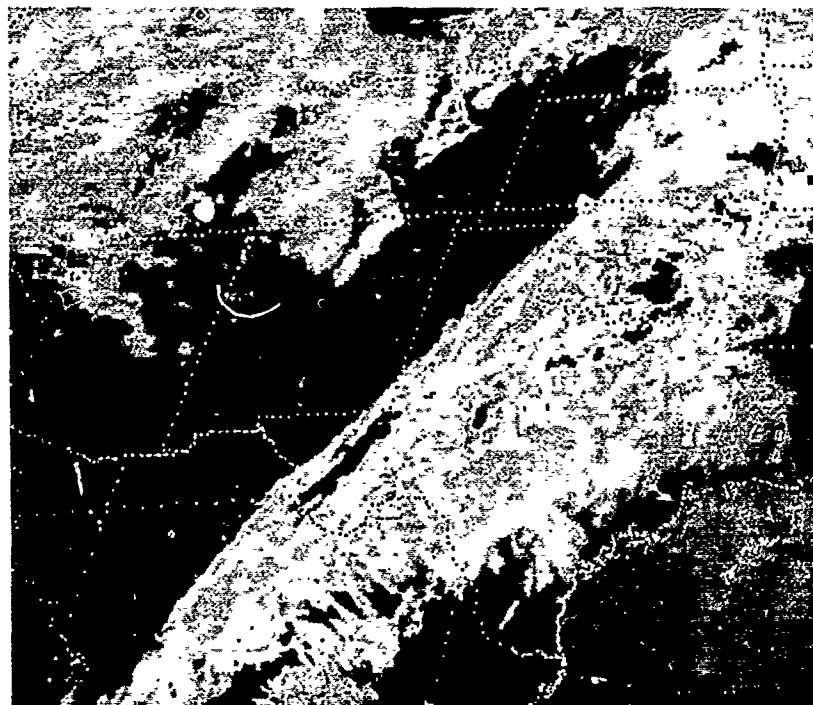


Figure 6. GOES Infrared Satellite Photo 1800Z 5 April 1978

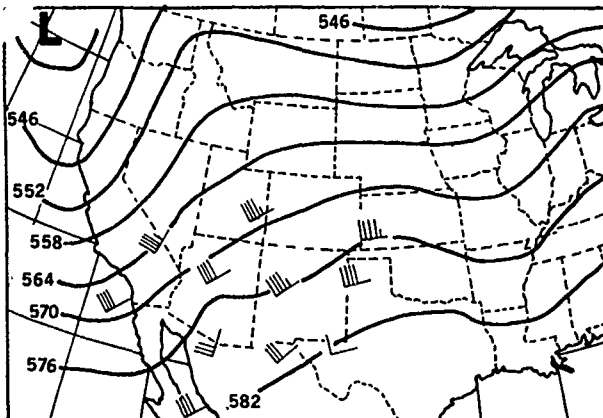


Figure 7. 500 Millibar  
Analysis 1200Z 4 April  
1978

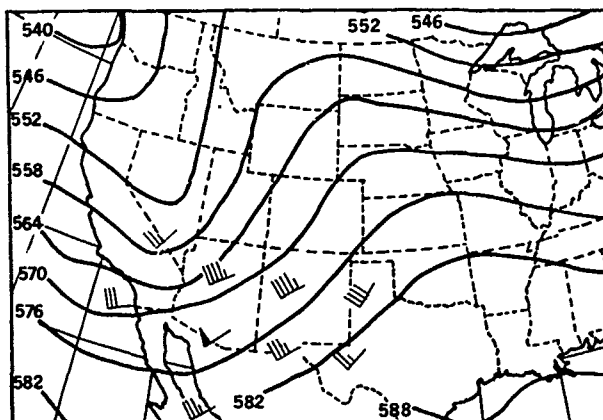


Figure 8. 500 Millibar  
Analysis 0000Z 5 April  
1978

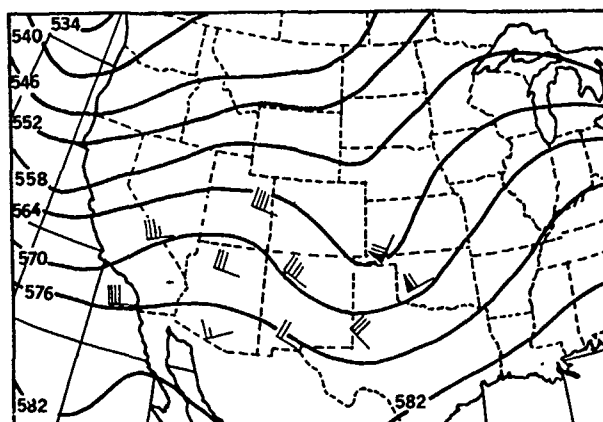


Figure 9. 500 Millibar  
Analysis 0000Z 6 April  
1978

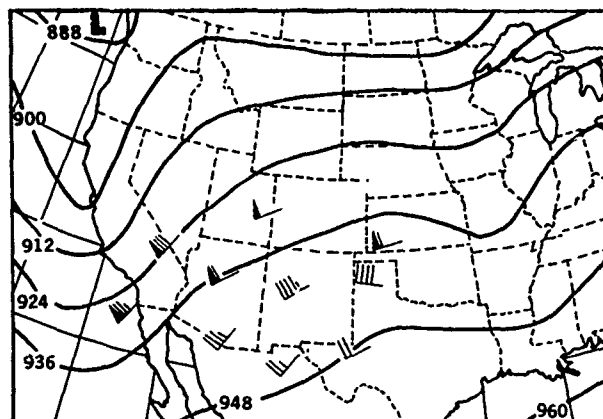


Figure 10. 300 Millibar Analysis 1200Z  
4 April 1978

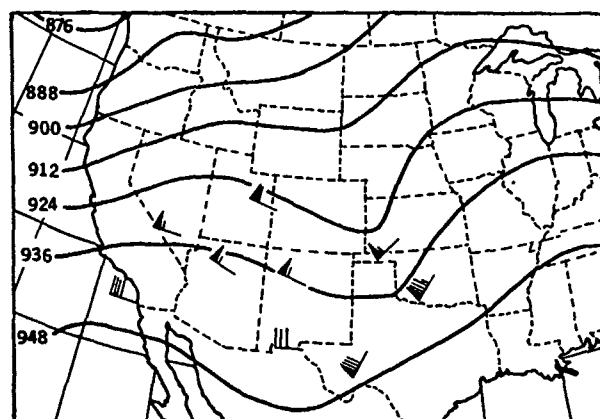


Figure 11. 300 Millibar Analysis 0000Z  
6 April 1978

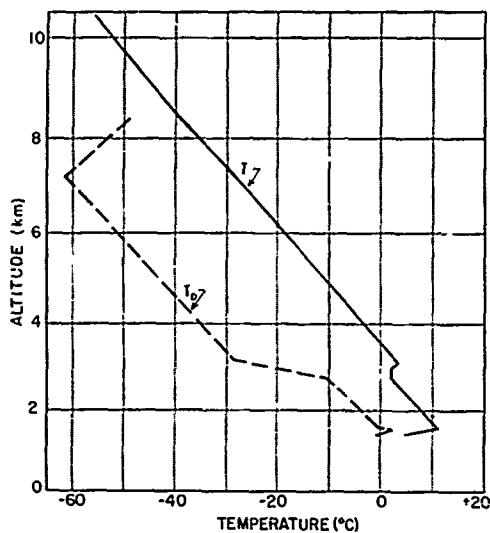


Figure 12. Winslow Sounding 1200Z  
4 April 1978

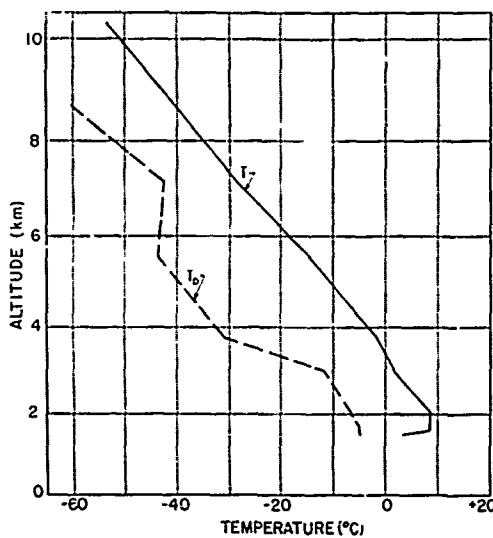


Figure 13. Albuquerque Sounding 1200Z  
4 April 1978

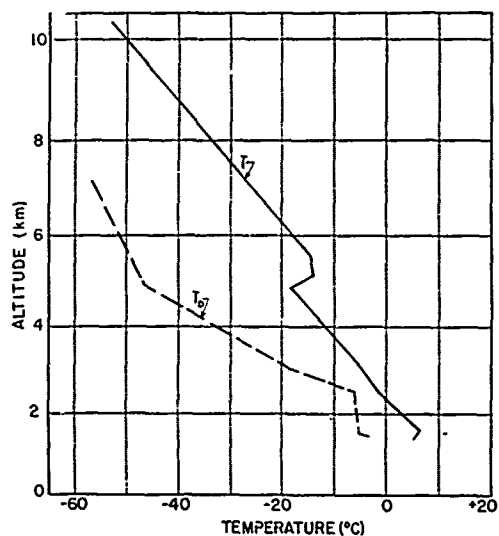


Figure 14. Winslow Sounding 1200Z  
5 April 1978

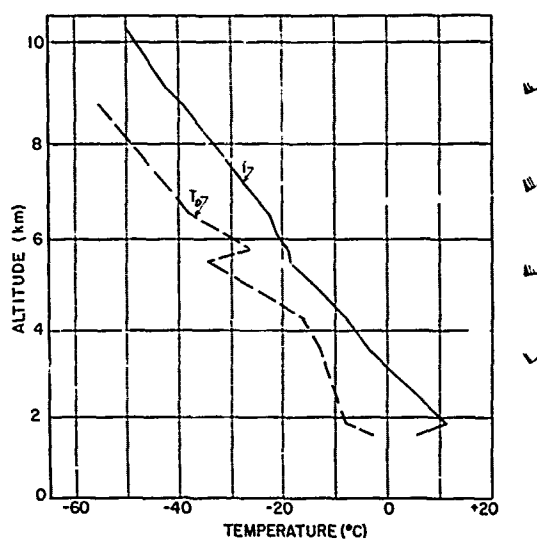


Figure 15. Albuquerque Sounding 1200Z  
5 April 1978



### 3. THE FLIGHT

The aircraft departed Kirtland AFB at 1656Z on 4 April and flew toward Farmington in northwest New Mexico. By 1800Z the aircraft was at 29,000 ft MSL (8.8 km) and was beginning to encounter thin cirrus. Figure 16 shows the tenuous cirrus the aircraft sampled as well as the more dense cirrostratus clouds which were to move steadily eastward during the flight. During the next hour, the aircraft was going in and out of thin cirrus, but the thicker cirrus and cirrostratus remained 1000 to 4000 ft above the aircraft's altitude. Figure 17, a photo taken about 30 min after, 10 miles east of, and 20 miles north of the Figure 16 location, shows how the clouds had advanced and were becoming denser.

At 1830Z the clouds observed from the airplane were dense enough to produce a halo around the sun. By 1835Z the airplane was beginning to sample some of the thicker cirrostratus clouds. Figure 18, a photo taken within 5 miles of the location of Figure 16, shows the clearly definable base of the cirrostratus below the aircraft. By 1855Z the aircraft was in the thicker cirrostratus. More particles and a wider variety of shapes, including many columns were observed. At 1900Z the aircraft began its return to Kirtland AFB, and by 1910Z was below the bases of the cirriform clouds. It landed at Kirtland at 1934Z.

On 5 April the aircraft departed Kirtland AFB at 1712Z and proceeded west toward Gallup, New Mexico and Winslow, Arizona, both almost due west of Albuquerque. As Figure 19 shows, there were fewer cirriform clouds on 5 April. The front had passed and only a few high, thin clouds were in the area. The aircraft climbed to 31,200 ft (9.5 km), but could not reach the main part of the visible cirrus. By 1830Z it was obvious that little data could be obtained in visible clouds the airplane began to return to Kirtland AFB. While enroute, it passed through the thin cirrus shown in Figure 20. The crew noted that this cirrus appeared to be fallout from higher layers. It was the only significant visible cloud encountered during the flight. The aircraft returned to Kirtland AFB at 1910Z.

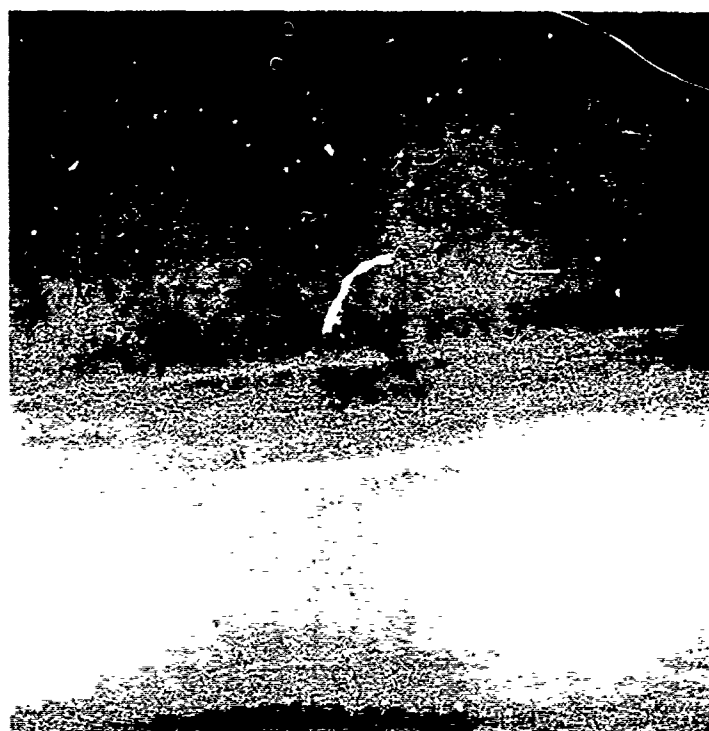


Figure 16. Clouds at 29,000 ft at 1800Z on 4 April 1978

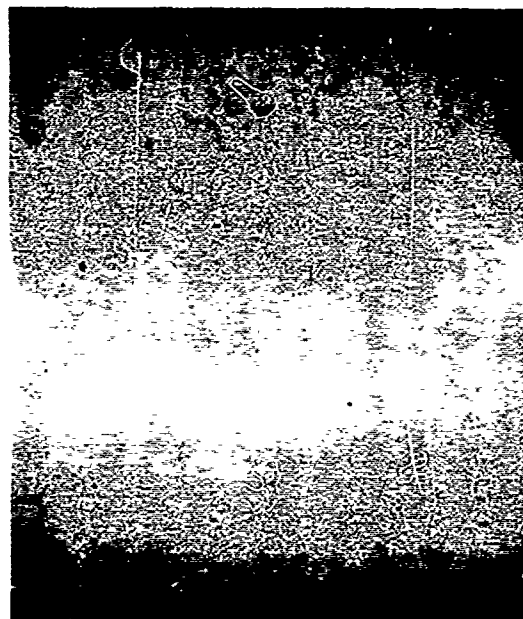


Figure 17. Clouds at 1828Z on 4 April 1978

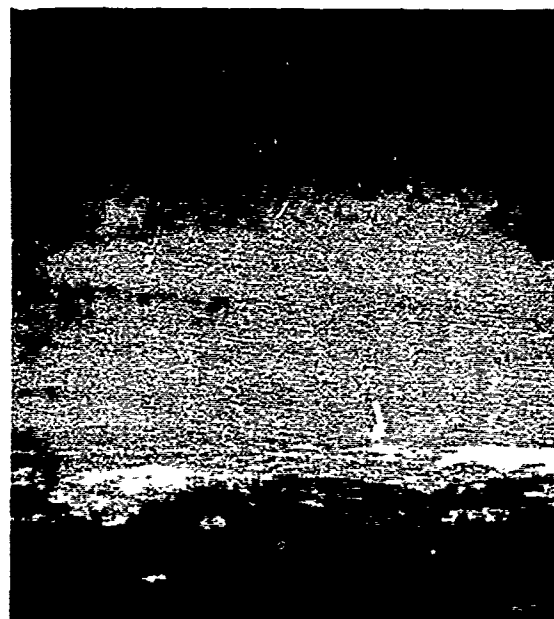


Figure 18. Clouds at 1837Z on 4 April 1978



Figure 19. Cirrus  
Clouds at 1752Z  
on 5 April 1978

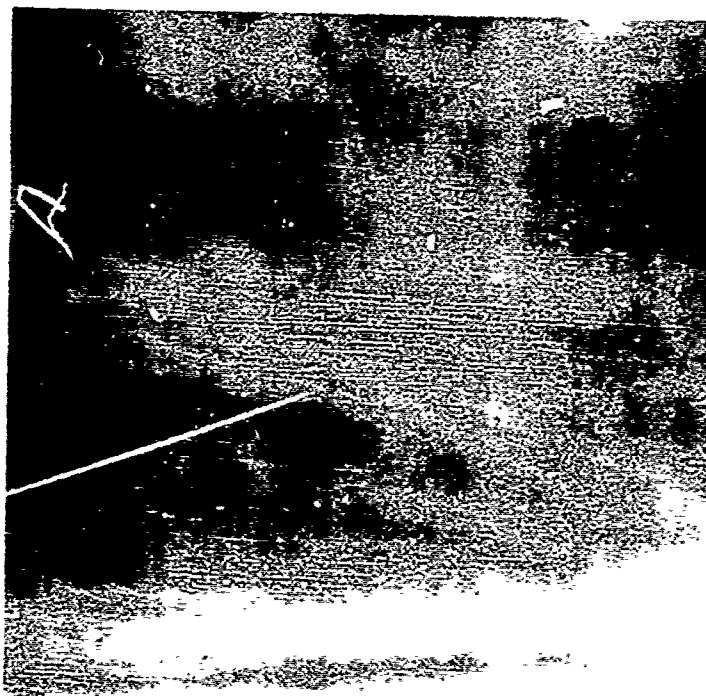


Figure 20. Cirrus  
Clouds at 1743Z  
on 5 April 1978

#### 4. DISCUSSION OF DATA

Figure 21 shows profiles of height, temperature, ice water content, medium volume diameter, and density of particles during the 4 April flight. The first hour of this flight is further discussed in the next section on sub-visible cirrus. Three instances of increased particle counts, starting at 1822, 1836, and 1856Z respectively were selected for closer study. Observations taken during the 5-min periods starting at each of these times will be examined in more detail. Also, data from a 5-min period starting at 1836Z on 5 April are discussed.

(a) At 1822Z on 4 April the aircraft entered a thin band of translucent cirrus clouds. Figure 22 shows the particle concentration observed during the time from 1822Z to 1827Z while the aircraft was in this band. Particles were observed in all channels of the cloud probe and also in the first two channels of the precip probe. Most of the particles were bullet rosettes. The vertical bars in the 2-D examples are 800  $\mu\text{m}$  in length. The nature of the cirrus was reflected both by the lack of large particles and the relatively low concentration of medium sized particles. The largest particles detected by the 1-D instruments were slightly less than 700  $\mu\text{m}$  in diameter. Figure 23 is a photograph of the cirrus clouds which provided these data.

(b) The cirrus observed at 1836Z was more uniform and stratified. Figure 24 shows the clouds examined during the period from 1836Z to 1841Z. They were still tenuous; with small snow mixed with bullet rosettes. The Mission Director estimated the visibility to be 50 miles. The largest particles (see Figure 25) were still about 700  $\mu\text{m}$  in size, but generally fewer particles were observed than during the 1822Z to 1827Z period. As a result, the ice water content decreased by a factor of three. The medium volume diameters, however, were larger, because while the number of small particles ( $< 200 \mu\text{m}$ ) decreased by a factor of eight, the number of particles in the 200 to 700  $\mu\text{m}$  range decreased by a factor of two. Note the increase in size of the particles shown in the 2-D examples.

(c) At 1856Z the aircraft was in a uniform band of cirrostratus which partially obscured the horizon. As Figure 26 shows, the medium volume diameter for the cloud probe during the 5-min period from 1856Z to 1901Z was higher than in the previous cases examined above. Also, there was a greater variety of particle types seen on the 2-D display at this time. The increase in the medium volume diameter is reflected in the larger particles in the 2-D example. The largest particles, however, remained in the 700  $\mu\text{m}$  range and the particle distribution curve changed only slightly. This band of cirrostratus was more closely associated with the approaching cold front, which explains the increased variety of particle types observed. The occurrence of small snow, bullet rosettes, and columns is

attributed to mixing of particles from different growth regions by the vertical motions associated with the frontal dynamics.

(d) The flight of 5 April yielded only a small amount of data on visible clouds, but a 5-min period beginning at 1836Z did involve passage through some thin visible cirrus. Very few shadowgraphs of larger particles were recorded by the 2-D probes. Most 2-D particles were less than one diode ( $20\ \mu\text{m}$ ) wide. This may be due to the high true air speed (about 280 knots/140 meters per second) which reduced the reliability of the 2-D system. The 1-D system recorded activity in the cloud and scatter probe ranges. There were data recorded in the first four channels (400 to  $1400\ \mu\text{m}$ ) of the precip probe. The particle size distribution for this time period is shown in Figure 27.

According to the Mission Director's comments (see Appendix A) most of the cirrus was above the aircraft. Braham and Spyers-Duran<sup>7</sup> calculates that cirrus particles may fall 20,000 ft (6 km) through clear air, so the cirrus sampled may have consisted mostly of particles which fell from denser cirrus above. As the satellite photographs (Figures 5 and 6) indicate, the cirrus in New Mexico was not directly associated with the front but rather with the post frontal short wave trough seen on Figures 8 and 9 (at 500 mb) and Figures 10 and 11 (at 300 mb). The cirrus was thinner and generally more tenuous than the prefrontal cirrus sampled the previous day.

---

7. Braham, R. R., and Spyers-Duran, P. (1967) Survival of cirrus crystals in clear air, J. Appl. Meteor. 6:1053-1061.

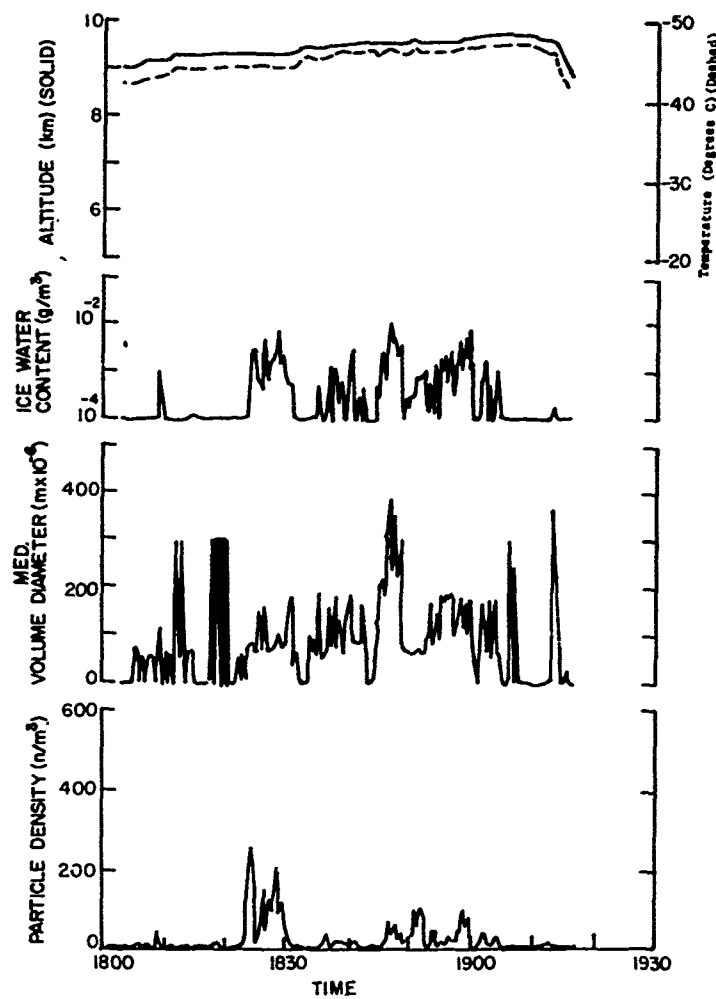


Figure 21. Altitude, Temperature, Ice Water Content, Medium Volume Diameter, and Particle Density for the Flight of 4 April 1978

ALTITUDE 9.31 km

TEMPERATURE -44.3 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT ( $\text{g m}^{-3}$ )	$1.66\text{E}^{-4}$	$8.57\text{E}^{-4}$	$1.78\text{E}^{-4}$	$1.03\text{E}^{-3}$
MED. VOL. DIAMETER ( $\mu\text{m}$ )	17	70	196	76

EXAMPLE 2-D PARTICLE FORMS



COMMENTS:

In thin translucent cirrus. Most observed particles were bullet rosettes. Largest particles were less than 700 microns in diameter.

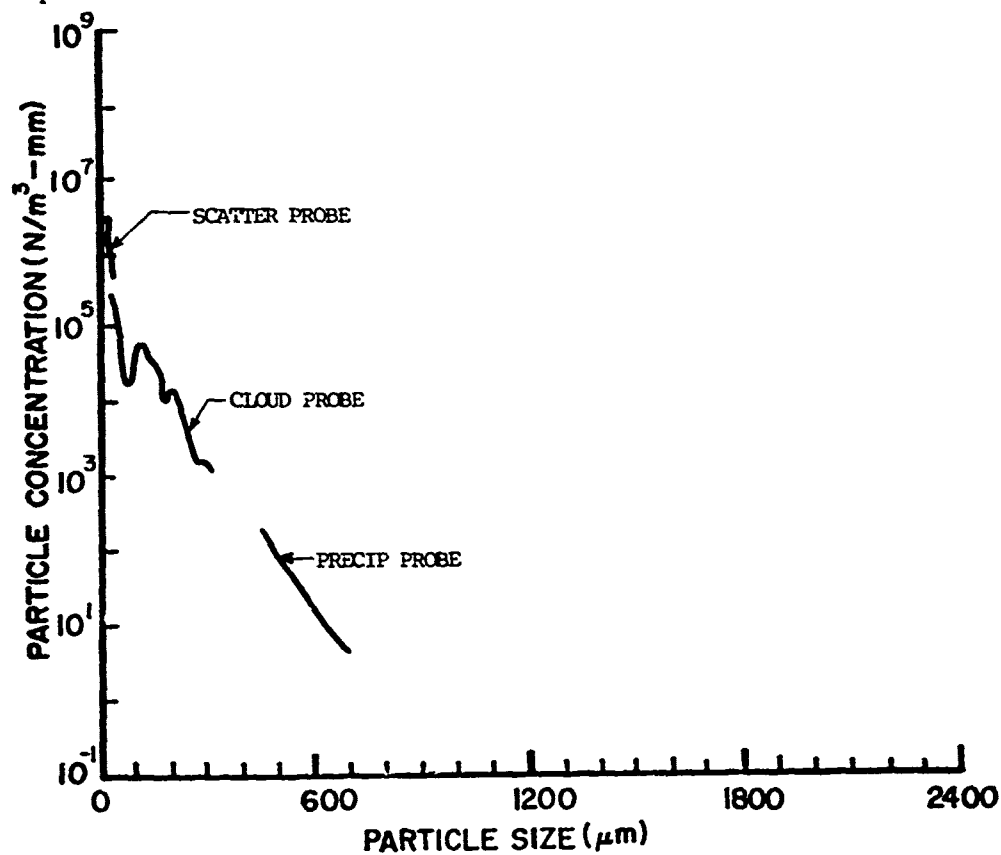


Figure 22. Particle Size Distribution 1822Z to 1827Z 4 April 1978



Figure 23. Cirrus Clouds During the First Sampling Period on 4 April

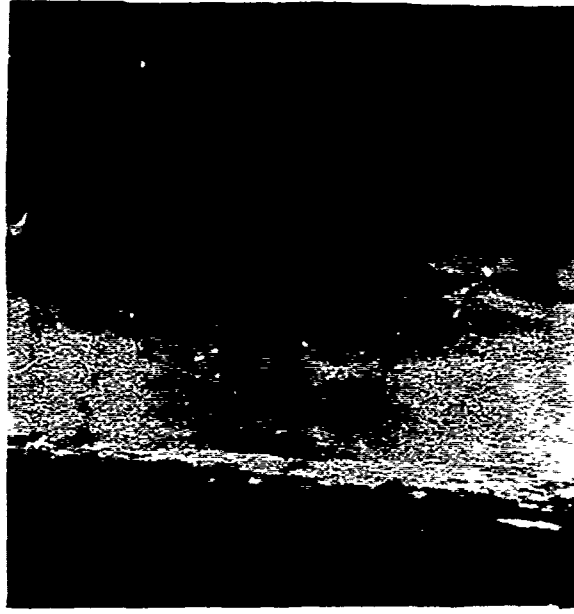


Figure 24. Cirrus Clouds During the Second Sampling Period on 4 April



ALTITUDE 9.52 km

TEMPERATURE -46.1 °C

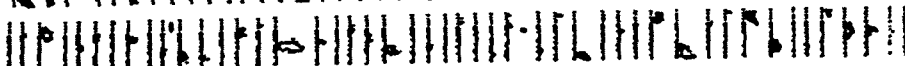
	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT ( $\text{g m}^{-3}$ )	$6.79\text{E}^{-5}$	$2.53\text{E}^{-4}$	$8.40\text{E}^{-5}$	$3.37\text{E}^{-4}$
MED. VOL. DIAMETER ( $\mu\text{m}$ )	7	93.	193	109

EXAMPLE 2-D PARTICLE FORMS

18:38:11



18:38:34



COMMENTS:

In thin cirrostratus. As in figure 22, there are few large particles. The number of small particles has decreased, thus increasing the medium volume diameter of the cloud probe. Shapes were primarily bullet rosette and small snow.

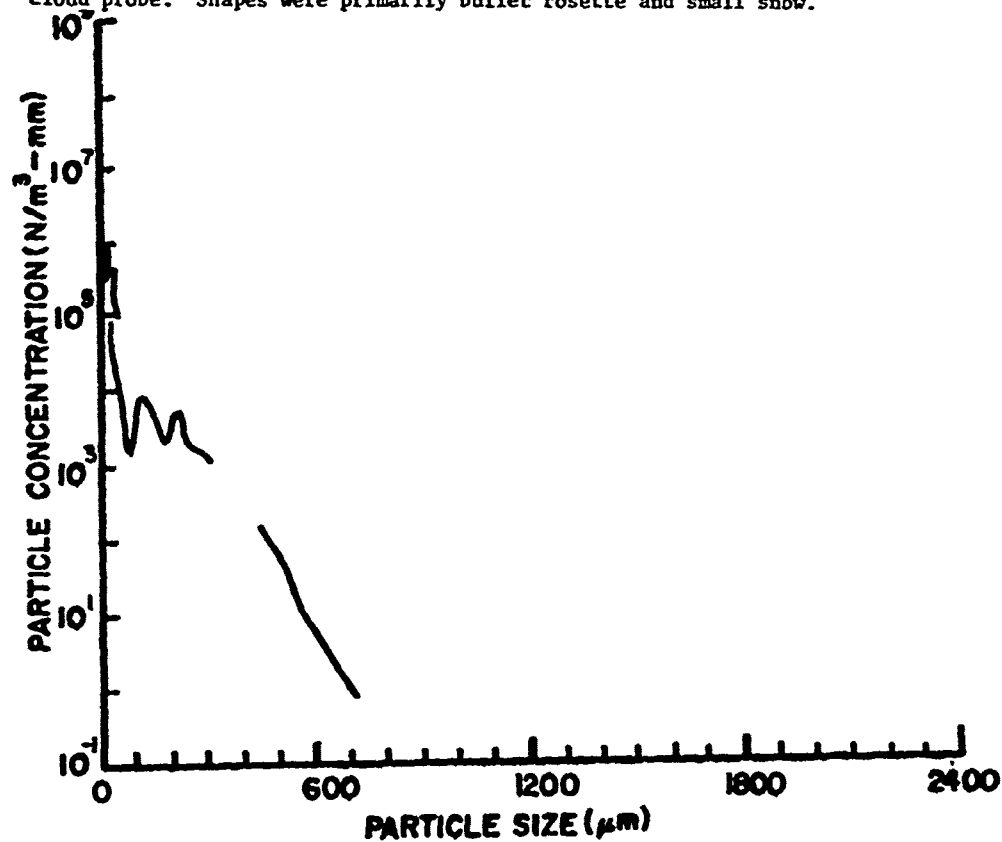



Figure 25. Particle Size Distribution 1836Z to 1841Z 4 April 1978


ALTITUDE 9.64 km

TEMPERATURE -47.0 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT ( $\text{g m}^{-3}$ )	$9.82\text{E}^{-5}$	$6.65\text{E}^{-4}$	$2.56\text{E}^{-4}$	$9.20\text{E}^{-4}$
MED. VOL. DIAMETER ( $\mu\text{m}$ )	14	105	192	122

EXAMPLE 2-D PARTICLE FORMS

18:57:49 

18:57:52 

COMMENTS:

In moderate cirrostratus. Size distribution is similar to figures 22 and 25, but the number of particles and the mean volume diameter of those particles recorded by the cloud probe have increased. Shapes include bullet rosettes, small snow, and columns.

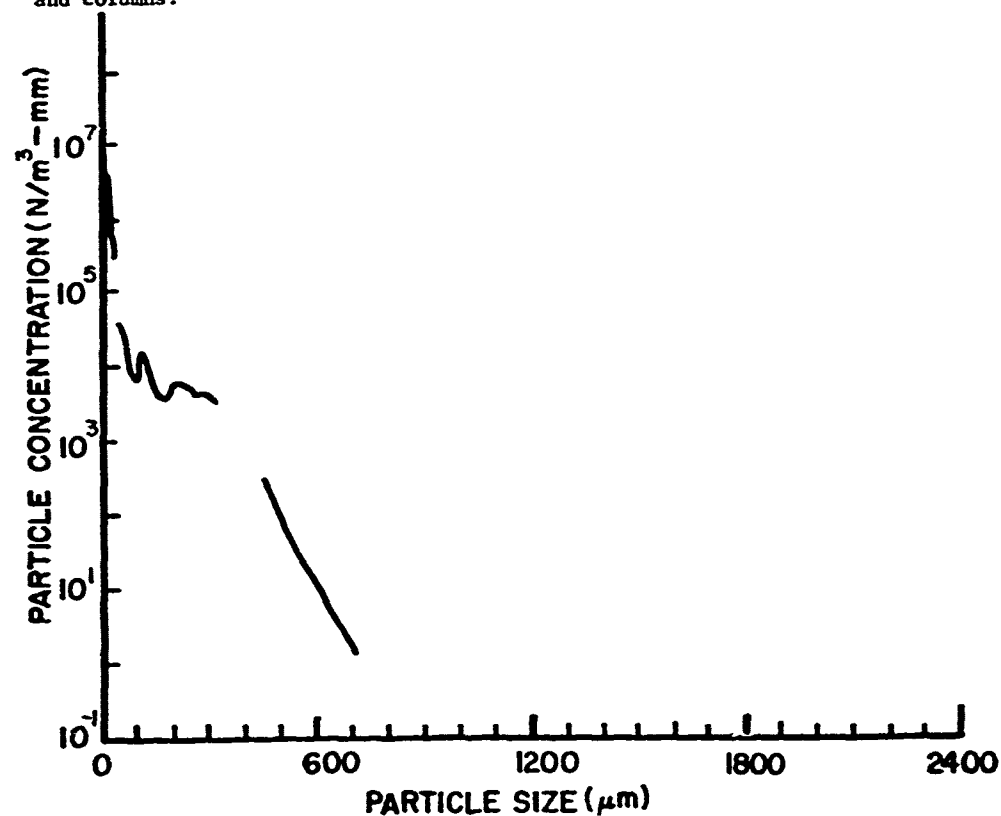


Figure 26. Particle Size Distribution 1856Z to 1901Z 4 April 1978

ALTITUDE 9.67 km

TEMPERATURE -47.9 °C

	SCATTER	PROBE CLOUD(C)	PRECIP(P)	C + P
ICE WATER CONTENT ( $\text{g m}^{-3}$ )	$3.72\text{E}^{-5}$	$1.12\text{E}^{-5}$	$1.29\text{E}^{-4}$	$1.41\text{E}^{-4}$
MED. VOL. DIAMETER ( $\mu\text{m}$ )	2	52	313	305

EXAMPLE 2-D PARTICLE FORMS

18:36:47



18:38:17



COMMENTS:

In thin cirrostratus; probably fallout from higher cirrostratus. While the number of particles in the cloud probe range was small, there were many particles in the 500 to 1300 micron range of the precip probe.

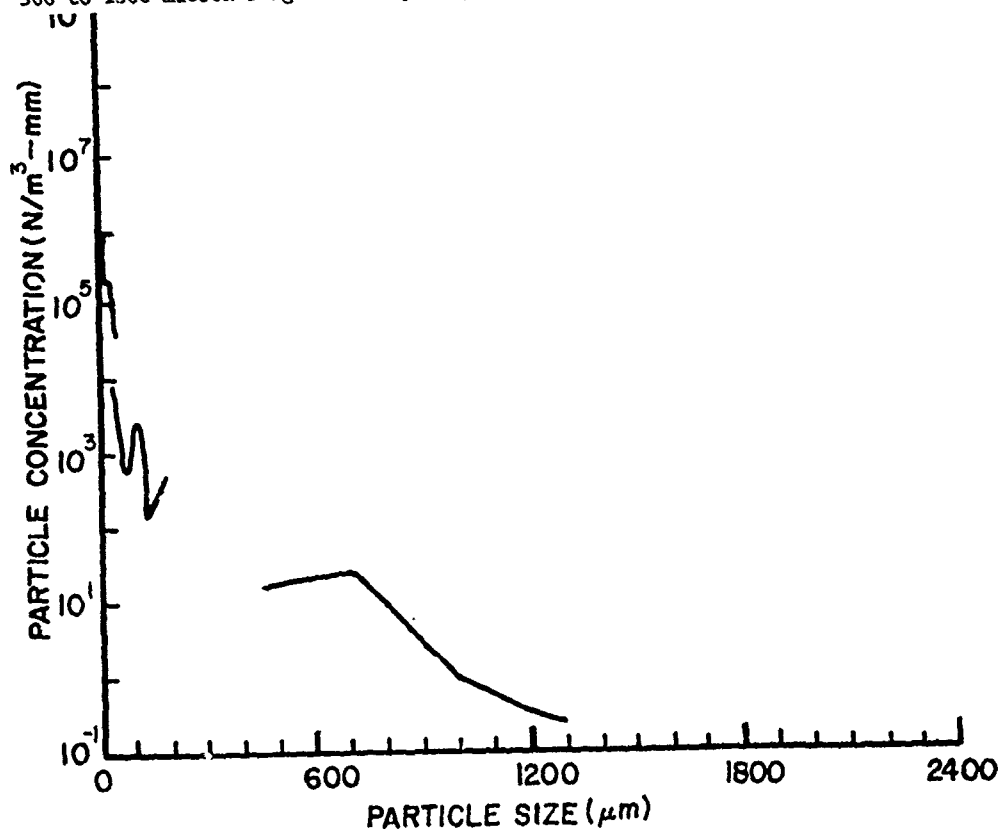


Figure 27. Particle Size Distribution 1836Z to 1841Z 5 April 1978

## 5. SUB-VISIBLE CIRRUS

While most of the particles observed on these flights occurred while the aircraft was in visible cirrus or cirrostratus clouds, some particles were detected in clear air. Barnes<sup>8</sup> has reported that several instances of this phenomena have occurred during other flights made by the MC-130E and another cloud physics aircraft. Particles 100 to 300  $\mu\text{m}$  in diameter were recorded on these flights with a few particles in excess of 1 mm being detected in otherwise clear air. These particles may be considered to be components of cirrus clouds which are too tenuous to be seen by the human eye; hence, the name sub-visible cirrus.

Ohtake, Jayaweera, and Sakurai<sup>9</sup> discuss the formation and observations of ice crystals in clear air at the surface in the polar regions. These particles were noted at similar temperatures, were of similar size and are commonly referred to as "diamond dust."

In addition to the large sub-visible cirrus particles observed when flying above 20,000 ft (6 km), there is generally a constant background distribution of small particles detected in the lower two channels (2 to 4  $\mu\text{m}$  diameter) of the scatter probe (ASSP). This background has been observed on all but a very few cirrus flights made by the MC-130E for this and other projects.

At lower altitudes and at above freezing temperatures, both Varley<sup>10</sup> and Cohen<sup>11</sup> observed particles in clear air at altitudes between 100 and 1000 ft over the ocean which ranged in size from 2 to 30  $\mu\text{m}$  and were recorded by the scatter (ASSP) probe on the MC-130E.

While Figure 21 shows the particle density and ice water content the aircraft found while in visible cirrus, the scale is not detailed enough to show the values obtained from the sub-visible cirrus and the ASSP background. Figures 28 and 29 show the ice water content recorded by the cloud and scatter probes for size ranges which includes these particles. As can be seen from Figures 28 and 29, the liquid water content due to these small background particles increased with altitude on both of the flights described in this report. Limitations of the ASSP for the measurements of ice crystals have been covered by Varley and Barnes.<sup>6</sup>

8. Barnes, A. A. (1980) Ice particles in clear air, Communications à la VIIIème Conférence Internationale sur la Physique des Nuages, Vol I, Clermont-Ferrand, France, 15-19 July 1980, pp 189-190.
9. Ohtake, T., Jayaweera, K. O. L. F., and Sakurai, K. (1978) Formation mechanism of ice crystals in cloudless atmosphere. Proceedings of Conference on Cloud Physics and Atmospheric Electricity, Issaquah, Washington, 31 July - 4 August 1978, pp 122-125.
10. Varley, D. J. (1979) A Marine Boundary Layer Sampling Flight in Clear Air, ERP No. 652, AFGL-TR-79-0013, AD A069723.
11. Cohen, I. D. (1979) Marine Boundary Layer Sampling Flight, Number 2, ERP No. 678, AFGL-TR-79-242, AD A

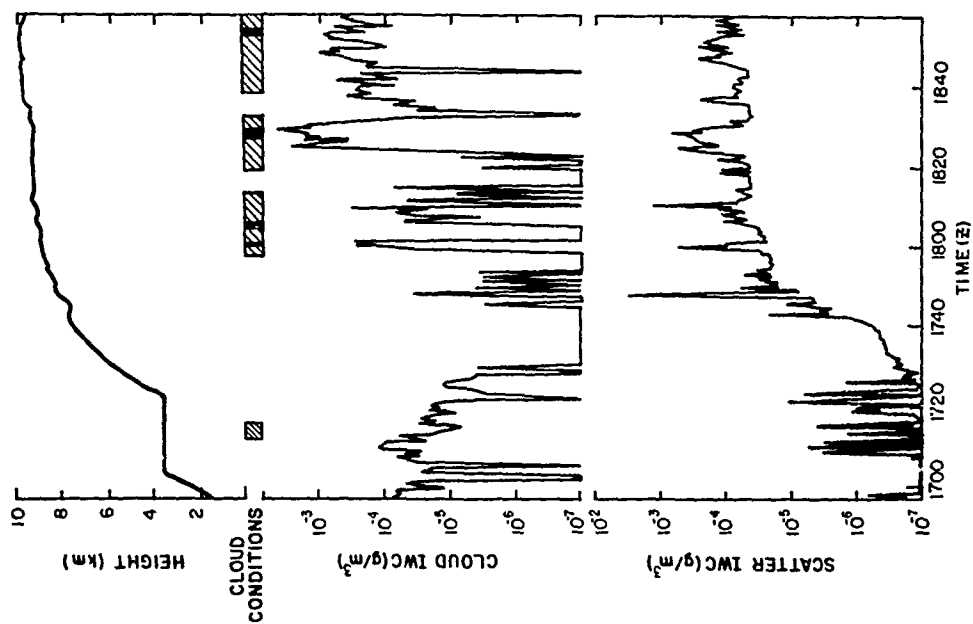


Figure 28. IWC and Cloud Cover vs Time for Flight of 4 April 1978

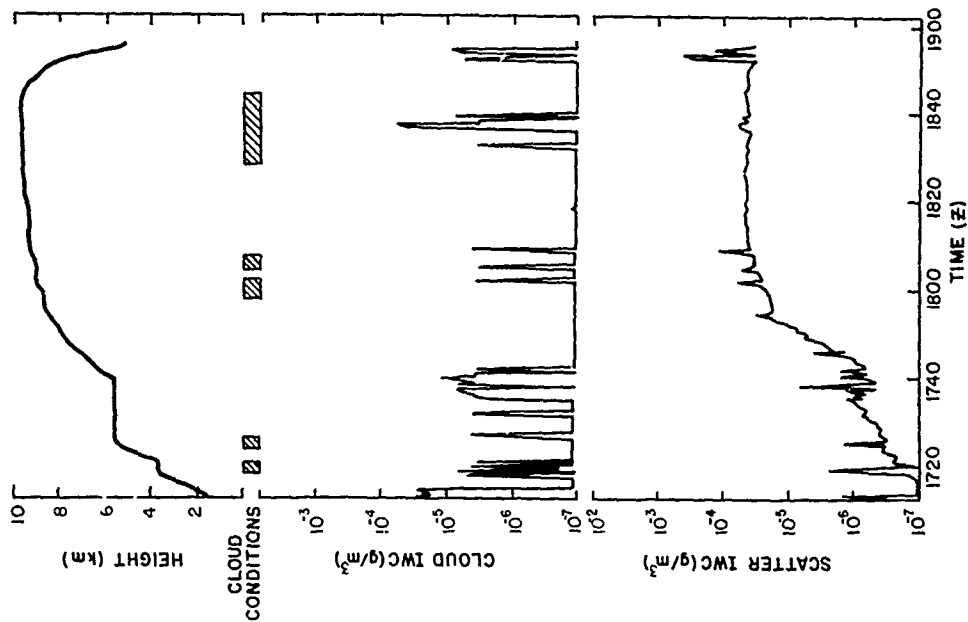


Figure 29. IWC and Cloud Cover vs Time for Flight of 5 April 1978

Portions of the flight during which the aircraft was in visible clouds are indicated by the "cloud condition" lines on Figures 28 and 29. These are subjectively determined densities of clouds the aircraft was in as determined from the Mission Director's comments (see Appendix A) and from the film taken by a 16 mm time-lapse camera mounted in the cockpit of the MC-130E. Segments marked by partial shading indicate times during which the airplane was in "thin cloud." During these times visibility was not obstructed, but filaments of cloud could easily be seen passing close to the airplane. Segments marked by solid shading indicate times during which the aircraft was in clouds dense enough to partially or completely obstruct the horizontal visibility.

Even though there was a good correlation between the 1-D and the 2-D data there was not a one-to-one correspondence between the subjective assessment of whether the airplane was in or out of cloud and the PMS particle readings. The subjective assessment introduces the concept of target acquisition against a similar background. A pertinent example is that of sub-visible cirrus in the tropics. High, thin cirrus was usually seen at sunrise and sunset at Kwajalein (8°N), but often not seen from the ground at noon time. Flights by a Learjet to 45,000 ft (13 km) during the middle of the day usually observed thin, wispy cirrus above the aircraft against the dark sky found at these high altitudes. Even though the thin cirrus was there, it could not be observed from the ground because of the sun light scattered by molecules and aerosols in the lower atmosphere.

Although the ASSP background appears similar on both flights, the presence of sudden increases in ice water content on both the scatter and cloud probes is much more evident on the 4 April flight (Figure 28). While this was most frequent while the plane appeared to be in cloud, it did occur while the airplane was not in visible cloud. As an example, at 1747Z on 4 April the airplane was in clear air, but, during a 30-sec period, eight particles ranging in size from 22 to 71  $\mu\text{m}$  were recorded by the 1-D cloud probe. These data are not included in the appendices, but are noticeable in Figure 28. As Figure 28 shows, there were many particles recorded by the cloud probe between 1740Z and 1750Z, even though the airplane was in clear air at the time according to the Mission Director's notes and a review of the 16 mm film.

The synoptic situation on 4 April was more dynamic, since a front was moving into the area, and there was more visible cirrus. This probably contributed to the presence of more sub-visible cirrus. Sub-visible cirrus also existed on 5 April behind the front, but it was less frequent. Typical sub-visible particle counts obtained in the lower two channels of the 1-D precip probe gave a number density of 0.5 to 1.0  $\text{m}^{-3}$  which is similar to that obtained by Barnes<sup>8</sup> in February 1980 using a modified 2-D precip probe.

On 5 April, some larger particles were sensed by the precip probe between 1842Z and 1844Z. These ranged from 400 to 2000  $\mu\text{m}$  in diameter. They were initially believed to be false indications, since particles of this size should have been observed by the crew. The Mission Director and technicians commented on the behavior of the 1-D precip probe 2 to 3 min after the particles were detected and, at that time, they felt that these particle counts recorded by the precip probe were false. This was near the end of the flight when the aircraft was returning to Albuquerque after finding very few clouds. The comments on the voice tape indicated that the Mission Director had been occupied with other duties during the time the particles were detected. In addition, the Mission Director had not been asked to look for sub-visible cirrus. The particle size distribution recorded by the precip probe from 1842Z to 1844Z appears to be exponential (Figure 30). This along with the absence of cloud probe data (partially attributed to a smaller sampling volume) plus the lack of an increase in the ASSP background strongly suggests that these were particles which had fallen out of thin, higher level cirrus clouds the smaller particles having been left behind or evaporated.

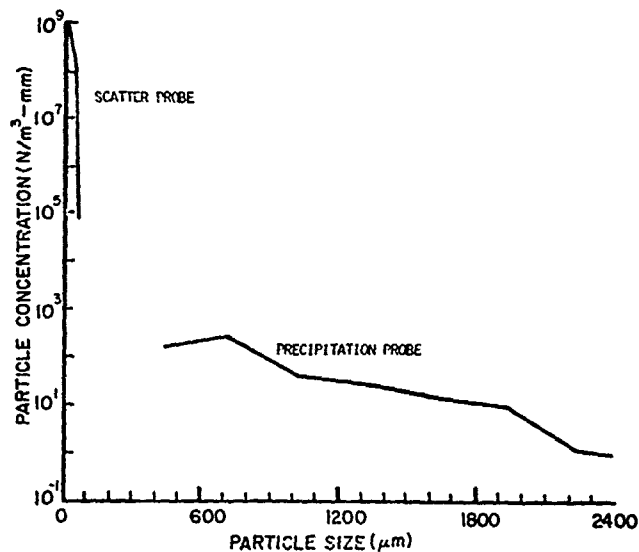


Figure 30. Particle Size Distribution 1842Z to 1844Z 4 April 1978

Inspection of the 2-D data confirmed the 1-D data when in cloud, but since the 2-D probes had not been modified at that time there were not enough 2-D data

obtained in sub-visible cirrus to fill the data buffers so that the data could be dumped onto tape for recording.

## 6. CONCLUDING REMARKS

The flights of 4 and 5 April 1978 have provided new data in thin ice-particle clouds. All four data periods examined involved thin cirrus at temperatures of  $-40^{\circ}\text{C}$  and altitudes in excess of 30,000 feet. Weickmann<sup>12</sup> and Grunow<sup>13</sup> noted that temperature affects the size and shape of crystals. Unfortunately, the MC-130E could not safely fly higher to more fully investigate the thin cirrus in the area. Only one of the previously cited reports (Varley<sup>5</sup>) deals with cirrus that are as high as as cold a temperature as these. The work of most other investigators (for example, Heymsfield and Knollenberg<sup>14</sup>) also generally deals with cirrus at lower altitudes and warmer temperatures. When sampling in visible clouds, the PMS 1-D instruments did, however, show a fairly large number of particles in the cloud probe range (26 to 311  $\mu\text{m}$ ), although very few were found in the precip probe range (437 to 4676  $\mu\text{m}$ ). Many particles were recorded while the airplane was not in visible cirrus. Thus there was sub-visible cirrus surrounding the visible clouds.

The sub-visible cirrus was sometimes formed by particles precipitating from higher cirrus. There were, however, instances of particles being formed in clear air with no visible cloud present.

There is no clear-cut boundary between visible and sub-visible cirrus. Rather, there is a continuity ranging from visible cirrus through tenuous cirrus to sub-visible cirrus.

The approach of the front led to a larger variety of particle types, but did not seem to have much effect on the ice water content or maximum particle size. These seemed to be constant within the mass of cirriform clouds which preceded the front.

The Mission Director, Capt Douglas Brooks, provided numerous photographs and comments on the 4 and 5 April 1978 flights. Some of the former are included in the body of this report while excerpts from the comments are found in Appendix A.

Appendix B contains the particle distributions for each of the four 5-min periods examined during this report.

Appendix C contains the particle distributions for 30-sec averages of selected periods during the flights of 4 April.

12. Weickmann, H. K. (1957) The snow crystals as an aerological sonde, Artificial Stimulation of Rain, Pergamon Press, pp 315-325.
13. Grunow, J. (1960) Snow crystal analysis as a method of indirect aerology, Physics of Precipitation, Am. Geophys. Union, pp 130-141.
14. Heymsfield, A. J., and Knollenberg, R. G. (1972) Properties of cirrus generating clouds, J. Atmos. Sci. 29:1358-1366.



Appendix D contains particle distributions for 30-sec averages of selected periods during the flight of 5 April. Some portions of both flights in which no data were recorded in either the cloud or precip probes have been omitted.

The particle distributions in Appendices C and D include data taken both while the airplane was in visible cirrus and while the airplane was not in visible cirrus. In addition, particle distributions from the intermediate level shown in Figures 28 and 29 are included. This level (about 6 km) represents the lower boundary of the region in which visible and sub-visible cirrus were present.

A list of abbreviations used in this report is presented in Appendix E.

## References

1. Varley, D.J. (1978) Cirrus Particle Distribution Study, Part 1, Air Force Surveys in Geophysics 394, AFGL-TR-78-0192, AD A061485.
2. Dyer, R.M. and Barnes, A.A. (1979) Microphysics of Ice Clouds - A Survey, Air Force Surveys in Geophysics 411, AFGL-TR-79-0103, AD A077020.
3. Varley, D.J., and Brooks, D.M. (1978) Cirrus Particle Distribution Study, Part 2, Air Force Surveys in Geophysics 399, AFGL-TR-78-0248, AD 063807.
4. Cohen, I.D. (1979) Cirrus Particle Distribution Study, Part 5, Air Force Surveys in Geophysics 414, AFGL-TR-79-0155, AD A077361.
5. Varley, D.J. (1978) Cirrus Particle Distribution, Study, Part 3, Air Force Surveys in Geophysics 404, AFGL-TR-78-0305, AD 066975.
6. Varley, D.J., and Barnes, A.A. (1979) Cirrus Particle Distribution Study, Part 4, Air Force Surveys in Geophysics 413, AFGL-TR-79-0134, AD A074763.
7. Braham, R.R., and Spyers-Duran, P. (1967) Survival of cirrus crystals in clear air, J. Appl. Meteor. 6:1053-1061.
8. Barnes, A.A. (1980) Ice particles in clear air, Communications à la VIIIème Conférence Internationale sur la Physique des Nuages, Vol I, Clermont-Ferrand, France, 15-19 July 1980, pp 189-190.
9. Ohtake, T., Jaweera, K.O.L.F., and Sakurai, K. (1978) Formation mechanism of ice crystals in cloudless atmosphere. Proceedings of Conference on Cloud Physics and Atmospheric Electricity, Issawuah, Washington, 31 July - 4 August 1978, pp 122-125.
10. Varley, D.J. (1979) A Marine Boundary Layer Flight in Clear Air, ERP No. 652, AFGL-TR-79-0013, AD A069723.
11. Cohen, I.D. (1979) Marine Boundary Layer Sampling Flight, Number 2, ERP No. 678, AFGL-TR-79-242, AD A
12. Weickmann, H.K. (1957) The snow crystals as an aerological sonde, Artificial Stimulation of Rain, Pergamon Press, pp 315-325.

## References

13. Grunow, J. (1960) Snow crystal analysis as a method of indirect aerology, Physics of Precipitation, Am. Geophys. Union, pp 130-141.
14. Heymsfield, A. J., and Knollenberg, R.G. (1972) Properties of cirrus generating clouds, J. Atmos. Sci. 29:1358-1366.

## Appendix A

### Transcript of Mission Director's Comments From the Flights of 4 and 5 April 1978

Following are selected comments made by Captain Douglas Brooks, the Mission Director on the flights of 4 and 5 April 1978. Abbreviations used are listed in Appendix E.

#### 4 April 1978 Mission Director Comments

17:58:27 In slight right turn—should be entering lower Ci shortly.  
:34 Thin, striated Ci.  
:48 Starting to get significant updates.  
18:00:06 Just at bases. Entering another patch. At 36° 54'N, 107° 23'W.  
Hdg: 222°. 29,600 ft.  
01:25 Passing out of one finger of cloud.  
:39 Below it. Nothing on ASSP.  
:49 Main bulk above—still very thin, a portion comes to the aircraft's flight level.  
04:21 Entering area of very thin Ci below main bulk.  
05:24 Hdg 104°, IAS 153 kts, OAT -28.5°C, TAS 246 kts.  
:27 In cloud. Very near bases of bulk. In and around bottoms.  
Sun visible, contrails above.  
06:17 In and out of undulating bases. No halo or other optical phenomena.  
07:05 Ground clearly visible. So are contrails and more Ci above.  
08:15 In and out of bases. Below bases of main cloud. In an autonomous layer below the main thin layer which covers the entire area.  
:44 In and out of very thin cloud.

18:10:32 Cloud is definitely Ci. Remnants of contrails. Just in bases at 29,900 ft. Nothing on snowstick.

11:11 2-D max size 800 to 1000 microns. Irregular ice. Bullet rosettes.

:47 Back in again. Very light. Just in bases of main layer.  
Sun above. No halo.

12:21 Density varies, but still thin Ci. Aircraft 2000 ft above Ci, clearly visible, 4000 ft.

13:57 Ci undulates. Main bulk still above.

14:35 Very small stuff. Dots on 2-D.

15:17 Stuff is moving in from the west.

16:01 Ci is moving in this direction.

:44 Multi-layered cloud is below overcast layer. Right at 29,000 ft, 36° 43'N, 107° 18'W. OAT -32°C, IAS 151 kts.

18:39 Above Cs, below striated Ci.

:51 In very thin Ci. Near bases. Can't be over 1000 ft thick.

22:30 Getting slightly more dense. Bases clearly visible below.  
No optical phenomena.

23:11 Still recording particles.

:37 Some clearly bullet rosettes, others rounded. Activity in droplet probe.

26:10 In very uniform Ci. Very thin cloud.

27:01 More like uniform Cs. Particles very small.

28:11 Tops visible. More Ci above. Clearly defined halo. Associated with sun above.

30:50 Climbing toward upper layer of Ci.

31:31 Uniform Ci above—extends at least to Albuquerque.

32:49 36° 42'N. 107° 27'W. Turning west, Hdg 280°, Alt 30,600 ft.

33:21 Leading edge of Cs is 10 nm W. More Ci above. Climbing will put us near tops of clouds.

34:24 Layer goes from 28,900 ft to 31,000 ft.

35:59 Entering particles from leading edge of cloud. Cs more uniform than the Ci above.

18:36:33 2-D cloud probe updating. Particles are bullet rosettes.

:39 In layer of Cs. It goes for another 4 to 5,000 ft.

37:16 Hdg 320°. In middle of layer. Bases clearly visible. Ci above.  
Visibility 50 to 60 miles. At 30,800', 248 kts, OAT -34.5°C  
IAS 152 kts, 36° 54'N, 107° 45'W.

38:39 Bases of Cs are uniform, Ci above less uniform.

39:30 In area of very thin Cs, Ci 500 ft above. Layers appear to merge.

18:40:17 Little change now. Couple of hundred ft below tops, approaching more dense Cs and Ci.

42:24 To the west clouds get lower and more dense.

42:43 37° 05'N, 108° 10'W. Passed into Cs. Can see below, also Ci layer above.

44:34 Snow stick—100 to 200 micron particles.

45:33 Almost continually in layer of Cs. Uniform, above are more striated Ci.

46:17 Hdg 030°. At 37° 16'N, 106° 13'W, OAT = -33.5°C, nice halo.

47:19 22 degree halo, light at edges. Definitely in Cs.

48:02 In very thin cloud. Beautiful halo. Ground and sky visible.  
Alt 30,885 ft.

48:52 Hdg 140°. At 37° 22', 107° 55', 31,100 ft. At top of Cs layer.

50:22 Particles are very small. At boundary between the two layers.

51:15 Intensity is very light. Only an occasional update. Halo is lost.  
No longer in Cs. Ci above does not produce a halo.

51:49 Weak halo, much less noticeable than one with Cs.

:50 Nice bullet rosettes and columns on 2-D display.

53:15 Particles come from Ci above. Generated at this level. At level of contrail. Suddenly halo is much more intense. Associated with cloud above. 37° 10'N, 107° 43'W, 30,900 ft, OAT = -34.5°C.

56:04 Altitude 30,900 ft. Passing into Cs. Heading 160° in thin Cs.

:19 Altitude 30,950 ft, Heading 210°. Horizon distantly visible.  
Uniform cloud. Break between it and Ci layer above.

57:13 Particles are beautiful, look like columns or side planes, bullet rosettes and columns. Bearø study.

:46 Very nice elongated columns on 2-D display.

58:05 In cloud—very thin.

59:40 LWC:02 g m<sup>-3</sup>.

:51 Still solidly in Cs.

19:01:50 Can see horizon at least 100 miles away.

02:30 36° 46'N, 107° 29'W. Cloud less dense. Still in Cs but it is extremely thin. Ci clearly visible above.

03:44 Still very thin. Little change.

04:20 Extremely thin Cs.

05:29 36° 35'N, 107° 24'W, 31,300 ft, 256 kts, OAT = -34.5°C.

06:39 Nothing falling from Cs layer above. Clear sky.

08:56 End of Ci. Below the bases.

5 April 1978 Mission Director Comments

17:12:15 Takeoff from Kirtland AFB.  
30:00 Winslow reporting Ci at 30,000 ft.  
49:11 Contrail to the left.  
52:50 Ci is definitely striated.  
53:31 Portions of Ci are very thin.  
18:15:00 Climbing toward Ci.  
19:43 35° 30'N, 109° 15'W. Abo e . n Ci unable to reach main Ci.  
21:40 Two layers, complete Cs above, some below, right on the nose.  
22:55 This level might get some of the more dense Ci.  
25:41 We appear to be approaching a patch.  
30:10 Ci above, but none at our level.  
:25 Return to base at this level.  
37:09 Very tiny particles on 2-D cloud probe.  
:32 Getting very thin Ci, possibly ice crystals from Ci above.  
38:08 Extremely thin, above us.  
39:00 Just below Ci. To the right, it may come to our level.  
:46 I think we're in it.  
40:06 Passed through an area just at flight level. An aircraft above us is  
at least 1000 ft below Ci.  
44:00 Did encounter small ice crystals. At the time the main bulk of clouds  
was 1000 ft above us.

## Appendix B

### Selected 5-min Average Particle Distributions From the Flights of 4 and 5 April 1978

The particle distributions in Appendices B, C, and D are in the same format as those in Appendices B and C of the previous report in this series.<sup>4</sup>

Five-min averages are included for the four periods examined in detail in the body of this report.



A Particle Distribution in tenuous cirrus at 1822-27Z on 4 April 78  
 FLIGHT 178-16 ON 4 APR 78 311 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 18:22:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)						PRESS (MB)
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	293.12
2	3.04E+09	26	3.20E+05	437	2.00E+02	ALT (KM)
3	9.46E+07	47	7.90E+04	706	3.25E+00	9.31
5	1.37E+07	67	1.32E+04	1911	0.	T -45.99C
7	9.89E+06	87	2.40E+04	1316	0.	FPT -43.2C
9	5.46E+06	108	7.61E+04	1622	0.	
11	5.49E+06	128	3.91E+04	1927	0.	TAS (M/S)
12	2.77E+06	148	2.95E+04	2233	0.	132.58
14	4.65E+06	169	8.86E+03	2539	0.	
15	3.75E+06	189	1.60E+04	2843	0.	Z 4.01E-03
18	1.63E+06	209	7.13E+03	3149	0.	
19	1.12E+06	230	2.62E+03	3454	0.	FORM F .40
21	9.66E+05	250	1.34E+03	3760	0.	
23	1.25E+06	271	1.48E+03	4065	0.	NT (V/M**3)
25	1.22E+06	291	1.63E+03	4370	0.	6.1775E+03
27	1.32E+06	311	1.22E+03	4676	0.	
						TOTALS
IWC	1.66E-04		8.57E-04		1.78E-04	1.03E-03
IED D	17		70		196	76

B. Particle Distribution in weak cirrus at 1836-41Z on 4 April 78  
 FLIGHT 178-16 ON 4 APR 78 311 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 18:36:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)						PRESS (MB)
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	284.41
2	3.17E+09	26	6.55E+04	437	1.14E+02	ALT (KM)
3	1.03E+08	47	1.46E+04	706	4.47E-01	9.52
5	2.21E+05	67	1.62E+03	1911	0.	T -47.89C
7	1.64E+06	87	2.64E+03	1316	0.	FPT -44.1C
9	5.75E+05	108	8.51E+03	1622	0.	
11	8.99E+05	128	6.07E+03	1927	0.	TAS (M/S)
12	5.14E+05	148	3.45E+03	2233	0.	131.78
14	5.91E+05	169	1.81E+03	2538	0.	
15	3.16E+05	189	4.51E+03	2843	0.	Z 1.73E-03
18	3.08E+05	209	3.23E+03	3149	0.	
19	1.27E+06	230	2.24E+03	3454	0.	FORM F .46
21	3.80E+05	250	1.45E+03	3760	0.	
23	2.58E+05	271	1.34E+03	4065	0.	NT (V/M**3)
25	4.90E+05	291	1.23E+03	4370	0.	1.1128E+03
27	1.29E+05	311	8.85E+02	4676	0.	
						TOTALS
IWC	5.79E-05		2.53E-04		8.40E-05	3.37E-04
IED D	7		97		193	109

C. Particle Distribution in uniform cirrostratus at 1856-1901Z on 4 April 78

FLIGHT E78-16 ON 4 APR 78 711 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18:56:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)						PRESS (MB)
SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	SIZE (μ)	PRECIP PROBE	279.36
2	2.97E+09	26	5.03E+04	437	3.24E+02	ALT (KM)
3	1.52E+08	47	4.25E+04	716	1.23E+00	9.63
5	7.66E+05	67	9.89E+03	1011	0.	T -48.91C
7	6.17E+05	87	7.63E+03	1316	0.	
9	4.14E+06	108	1.86E+04	1622	0.	FPT -44.4C
11	3.06E+06	128	7.12E+03	1927	0.	
12	1.45E+06	148	4.80E+03	2233	0.	TAS (M/S)
14	1.61E+06	169	3.48E+03	2538	0.	129.13
16	1.19E+06	189	5.97E+03	2843	0.	
18	8.16E+05	209	7.15E+03	3149	0.	Z 5.33E-03
19	5.81E+05	230	8.05E+03	3454	0.	
21	5.02E+05	250	4.06E+03	3760	0.	FORM F .46
23	6.59E+05	271	4.45E+03	4065	0.	
25	7.13E+05	291	4.89E+03	4370	0.	NT (N/M <sup>2</sup> ·3)
27	4.74E+05	311	7.35E+03	4676	0.	2.7718E+03
TOTALS						
IWC	9.82E-05		5.65E-04		2.56E-04	9.20E-04
MEAN	14		105		192	122

D. Particle Distribution in thin cirrus at 1836-41Z on 5 April 78

FLIGHT E78-17 ON 5 APR 78 311 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18:36:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)						PRESS (MB)
SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	SIZE (μ)	PRECIP PROBE	277.82
2	2.62E+09	26	1.23E+04	437	1.32E+01	ALT (KM)
3	1.49E+08	47	2.44E+03	706	2.13E+01	9.67
5	5.53E+05	67	3.82E+02	1011	7.85E-01	T -49.75C
7	7.49E+05	87	2.49E+03	1316	2.06E-01	
9	5.09E+05	108	1.54E+03	1622	0.	FPT -49.4C
11	3.63E+05	128	1.14E+02	1927	0.	
12	2.42E+05	148	3.60E+02	2233	0.	TAS (M/S)
14	2.43E+05	169	0.	2538	0.	139.09
16	2.16E+05	189	0.	2843	0.	
18	2.42E+05	209	0.	3149	0.	Z 9.99E-03
19	4.83E+04	230	0.	3454	0.	
21	4.85E+04	250	0.	3760	0.	FORM F .21
23	2.41E+04	271	0.	4065	0.	
25	0.	291	0.	4370	0.	NT (N/M <sup>2</sup> ·3)
27	2.42E+04	311	0.	4676	0.	1.5910E+02
TOTALS						
IWC	3.72E-05		1.12E-05		1.29E-04	1.41E-04
MEAN	2		0?		313	305

## Appendix C

### Selected 30-sec Average Particle Distributions From the Flight of 4 April 1978

Thirty-sec averages are provided for the portion of the 4 April 1978 flight in which the probes registered the most activity. Other portions of the flight have been deleted to conserve space.

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17:10:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	5.62E+06	26	4.20E+05	437	0.	647.85
3	0.	47	9.77E+04	706	0.	3.61
5	0.	57	1.76E+04	1011	0.	T -0.34C
7	2.25E+05	87	4.20E+03	1316	0.	FPT -29.3C
9	0.	108	2.86E+03	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	150.84
12	0.	148	0.	2233	0.	
14	2.24E+05	169	0.	2538	0.	Z 9.71E-06
16	0.	189	0.	2943	0.	
18	2.24E+05	209	0.	3149	0.	FORM F1.46
19	2.24E+05	230	0.	3454	0.	
21	0.	250	0.	3760	0.	NT(N/M**3)
23	0.	271	0.	4065	0.	2.4320E+03
25	0.	291	0.	4370	0.	
27	0.	311	0.	4676	0.	TOTALS
INC	3.68E-06	1.19E-04	0.	1.19E-04	29	
4ED 0	18	29	0.	0.	27	

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17:10:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	6.52E+06	26	4.86E+05	437	0.	640.05
3	0.	47	9.33E+04	706	0.	3.61
5	0.	57	2.12E+04	1011	0.	T -0.27C
7	0.	87	0.	1316	0.	FPT -29.5C
9	0.	108	1.43E+03	1622	0.	TAS (M/S)
11	0.	128	1.06E+03	1927	0.	150.76
12	0.	148	0.	2233	0.	
14	0.	169	0.	2538	0.	Z 9.20E-06
16	0.	189	0.	2843	0.	
18	0.	209	0.	3149	0.	FORM F1.58
19	0.	230	0.	3454	0.	
21	0.	250	0.	3760	0.	NT(N/M**3)
23	0.	271	0.	4065	0.	2.3194E+03
25	0.	291	0.	4370	0.	
27	0.	311	0.	4676	0.	TOTALS
INC	3.68E-06	1.21E-04	0.	1.21E-04	27	
4ED 0	2	27	0.	0.	27	

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17:11:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	7.01E+06	26	4.02E+05	437	0.	640.08
3	0.	47	2.25E+04	706	0.	3.61
5	0.	57	1.77E+04	1011	0.	T -0.00C
7	0.	87	0.	1316	0.	FPT -28.7C
9	0.	108	1.44E+03	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	149.9C
12	0.	148	0.	2233	0.	
14	0.	169	0.	2538	0.	Z 5.01E-06
16	0.	189	0.	2843	0.	
18	0.	209	0.	3149	0.	FORM F2.27
19	0.	230	0.	3454	0.	
21	0.	250	0.	3760	0.	NT(N/M**3)
23	0.	271	0.	4065	0.	0.5173E+02
25	0.	291	0.	4370	0.	
27	0.	311	0.	4676	0.	TOTALS
INC	6.11E-08	7.75E-05	0.	0.	25	
4ED 0	2	25	0.	0.	25	

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17:11:00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	8.80E+06	26	5.76E+04	437	0.	547.9C
3	0.	47	1.50E+04	706	0.	3.61
5	0.	57	3.57E+03	1011	0.	T -0.08C
7	2.26E+05	87	0.	1316	0.	FPT -25.3C
9	0.	108	2.07E+03	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	150.04
12	0.	148	0.	2233	0.	
14	0.	169	0.	2538	0.	Z 3.25E-06
16	0.	189	0.	2843	0.	
18	0.	209	0.	3149	0.	FORM F1.12
19	0.	230	0.	3454	0.	
21	2.26E+05	250	0.	3760	0.	NT(N/M**3)
23	0.	271	0.	4065	0.	4.3727E+02
25	0.	291	0.	4370	0.	
27	0.	311	0.	4676	0.	TOTALS
INC	2.32E-06	2.22E-05	0.	0.	34	
4ED 0	21	34	0.	0.	34	

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 171210J

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	647.90
2	8.39E+06	5.75E+04	437 0.	3.61	
3	0.	7.54E+03	706 0.		
5	0.	1.41E+04	1011 0.	T	.05C
7	0.	2.12E+02	1316 0.	FPT	-30.0C
9	0.	1.44E+03	1622 0.	TAS (M/S)	
11	0.	0.	1927 0.	2237	0.
12	0.	0.	2538	149.44	
14	0.	0.	2538	0.	
15	0.	0.	2538	0.	
16	0.	0.	3149	0.	
18	0.	0.	3454	0.	
19	0.	0.	3760	0.	
21	0.	0.	4065	0.	
23	0.	0.	4370	0.	
25	0.	0.	4676	0.	
27	0.	0.	4676	0.	
TOTALS				ALT (KM)	647.90
IMC	7.31E-04	2.78E-05	0.		
LED	2	40	0		

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 171210J

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	647.40
2	4.48E+06	1.71E+05	437 0.	3.62	
3	0.	2.25E+04	706 0.		
5	0.	0.	1011 0.	T	.01C
7	0.	4.19E+03	1316 0.	FPT	-26.2C
9	0.	1.43E+03	1622 0.	TAS (M/S)	
11	0.	0.	1927 0.	2237	0.
12	0.	0.	2538	151.23	
14	0.	0.	2538	0.	
15	0.	0.	3149	0.	
16	0.	0.	3454	0.	
18	0.	0.	3760	0.	
19	0.	0.	4065	0.	
21	0.	0.	4370	0.	
23	0.	0.	4676	0.	
25	0.	0.	4676	0.	
27	0.	0.	4676	0.	
TOTALS				ALT (KM)	647.40
IMC	3.94E-08	3.94E-05	0.		
LED	2	27	0		

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 171213J

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	647.96
2	6.09E+06	3.16E+05	437 0.	3.61	
3	0.	1.51E+04	706 0.		
5	0.	1.42E+04	1011 0.	T	.12C
7	0.	0.	1316 0.	FPT	-29.2C
9	0.	2.07E+03	1622 0.	TAS (M/S)	
11	0.	0.	1927 0.	2237	0.
12	0.	0.	2538	150.14	
14	0.	0.	2538	0.	
15	0.	0.	3149	0.	
16	0.	0.	3454	0.	
18	0.	0.	3760	0.	
19	0.	0.	4065	0.	
21	0.	0.	4370	0.	
23	0.	0.	4676	0.	
25	0.	0.	4676	0.	
27	0.	0.	4676	0.	
TOTALS				ALT (KM)	647.96
IMC	5.31E-08	6.36E-05	0.		
LED	2	25	0		

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-15 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 171313J

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	647.67	
2	5.10E+06	26	7.15E+00	3.62		
3	0.	47	0.			
5	0.	67	0.			
7	0.	87	0.			
9	0.	108	0.			
11	0.	128	0.			
12	0.	148	0.			
14	0.	169	0.			
15	2.26E+05	189	0.			
16	0.	209	0.			
18	0.	230	0.			
21	0.	250	0.			
23	0.	271	0.			
25	0.	291	0.			
27	0.	311	0.			
TOTALS						
IMC	3.66E-07	2.34E-05	6.11E-06	2.95E-05		
LED	16	26	0			

AFML CIRRUS STUDY BY AFGL  
FLIGHT 578-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17115103

AFML CIRRUS STUDY BY AFGL  
FLIGHT 578-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17114103

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRESS (MB)	647.26	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRESS (MB)	647.87
2	4.92E+06	26	2.64E+04	437	6.01E+00	3.62		2	5.08E+06	26	1.	437	4.98E+00		
3	0.	47	0.	706	0.			3	0.	47	1.	706	0.		
5	0.	67	3.49E+03	1011	0.	T -1.05C		5	0.	67	0.	1011	0.	T -23C	
7	0.	87	0.	1316	0.			7	0.	87	0.	1316	0.		
9	0.	108	2.65E+03	1622	0.	FPT -28.1C		9	0.	108	2.68E+03	1622	0.	FPT -31.4C	
11	0.	128	0.	1927	0.			11	0.	128	0.	1927	0.		
12	0.	148	0.	2233	0.	TAS (M/S)		12	0.	148	0.	2233	0.	TAS (M/S)	
14	0.	169	0.	2538	0.	151.83		14	0.	169	0.	2538	0.	149.86	
16	0.	189	0.	2943	0.			16	0.	189	0.	2943	0.		
18	0.	209	0.	3149	0.	Z 7.16E-05		18	0.	209	0.	3149	0.	Z 5.95E-05	
19	0.	230	0.	3454	0.			19	0.	230	0.	3454	0.		
21	0.	250	0.	3763	0.	FORM F .35		21	0.	250	0.	3763	0.	FORM F .33	
23	0.	271	0.	4165	0.	NT(N/M**3)		23	0.	271	0.	4165	0.	NT(N/M**3)	
25	0.	291	0.	4370	0.	1.3047E+02		25	0.	291	0.	4370	0.		
27	0.	311	0.	4576	0.			27	0.	311	0.	4576	0.	5.9795E+01	
TOTALS				TOTALS				TOTALS				TOTALS			
IMC	4.23E-04	2	1.24E-05	45	5.13E-06	191		IMC	7.14E-07	14	6.01E-06	191	4.26E-06	1.03E-05	60
VED	0							VED	0						

AFML CIRRUS STUDY BY AFGL  
FLIGHT 578-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17115133

AFML CIRRUS STUDY BY AFGL  
FLIGHT 578-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17114133

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRESS (MB)	647.43	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRESS (MB)	647.84
2	8.38E+06	26	2.67E+04	437	0.	3.62		2	1.25E+07	26	8.65E+04	437	5.54E-01		
3	0.	47	7.66E+03	706	0.			3	0.	47	7.66E+03	706	0.		
5	0.	67	3.51E+03	1011	0.	T -72C		5	0.	67	0.	1011	0.	T .18C	
7	0.	87	0.	1316	0.			7	0.	87	0.	1316	0.		
9	0.	108	1.43E+03	1622	0.	FPT -23.9C		9	0.	108	2.68E+03	1622	0.	FPT -32.5C	
11	0.	128	0.	1927	0.			11	0.	128	0.	1927	0.		
12	0.	148	0.	2233	0.	TAS (M/S)		12	0.	148	0.	2233	0.	TAS (M/S)	
14	0.	169	0.	2538	0.	150.96		14	0.	169	0.	2538	0.	149.28	
16	0.	189	0.	2943	0.			16	0.	189	0.	2943	0.		
18	0.	209	0.	3149	0.	Z 1.02E-06		18	0.	209	0.	3149	0.	Z 9.08E-06	
19	0.	230	0.	3454	0.			19	0.	230	0.	3454	0.		
21	0.	250	0.	3763	0.	FORM F1.11		21	0.	250	0.	3763	0.	FORM F .89	
23	0.	271	0.	4165	0.	NT(N/M**3)		23	0.	271	0.	4165	0.	NT(N/M**3)	
25	0.	291	0.	4370	0.	2.5598E+02		25	0.	291	0.	4370	0.		
27	0.	311	0.	4576	0.			27	0.	311	0.	4576	0.	2.1349E+02	
TOTALS				TOTALS				TOTALS				TOTALS			
IMC	7.05E-06	2	1.24E-05	36	0.	1.24E-05	36	IMC	1.09E-07	2	2.30E-05	191	4.71E-07	2.05E-05	27
VED	0							VED	0						

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1711901

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1711901

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	ALT (KM)
2	1.09E+07	26	5.67E+04	437	5.45E-01	646.98	3.63
3	0.	47	0.	706	0.	0.	0.
5	0.	67	6.99E+03	1011	0.	0.	0.
7	0.	87	0.	1316	0.	0.	0.
9	0.	108	1.42E+02	1622	0.	0.	0.
11	0.	128	0.	1927	0.	0.	0.
12	0.	148	0.	2233	0.	0.	0.
14	0.	169	0.	2538	0.	0.	0.
16	0.	189	0.	2843	0.	0.	0.
18	0.	209	0.	3149	0.	0.	0.
20	0.	230	0.	3454	0.	0.	0.
22	0.	250	0.	3760	0.	0.	0.
24	0.	271	0.	4065	0.	0.	0.
26	0.	291	0.	4370	0.	0.	0.
28	0.	311	0.	4676	0.	0.	0.
TOTALS				TOTALS			
IMC	3.53E-08	1.59E-05	4.66E-07	1.73E-05	9.09E-07	1.73E-05	9.09E-07
WED	0	39	191	23	8	191	24

47

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1711913

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1711913

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	ALT (KM)
2	1.01E+07	26	0.	437	1.09E+00	646.99	3.63
3	0.	47	0.	706	0.	0.	0.
5	0.	67	7.04E+03	1011	0.	0.	0.
7	0.	87	0.	1316	0.	0.	0.
9	0.	108	0.	1622	0.	0.	0.
11	0.	128	0.	1927	0.	0.	0.
12	0.	148	0.	2233	0.	0.	0.
14	0.	169	0.	2538	0.	0.	0.
16	0.	189	0.	2843	0.	0.	0.
18	0.	209	0.	3149	0.	0.	0.
20	0.	230	0.	3454	0.	0.	0.
22	0.	250	0.	3760	0.	0.	0.
24	0.	271	0.	4065	0.	0.	0.
26	0.	291	0.	4370	0.	0.	0.
28	0.	311	0.	4676	0.	0.	0.
TOTALS				TOTALS			
IMC	0.02E-08	5.73E-06	1.73E-05	9.09E-07	1.73E-05	9.09E-07	1.73E-05
WED	0	42	23	8	191	24	24

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	ALT (KM)
2	1.01E+07	26	0.	437	1.09E+00	646.99	3.63
3	0.	47	0.	706	0.	0.	0.
5	0.	67	7.04E+03	1011	0.	0.	0.
7	0.	87	0.	1316	0.	0.	0.
9	0.	108	0.	1622	0.	0.	0.
11	0.	128	0.	1927	0.	0.	0.
12	0.	148	0.	2233	0.	0.	0.
14	0.	169	0.	2538	0.	0.	0.
16	0.	189	0.	2843	0.	0.	0.
18	0.	209	0.	3149	0.	0.	0.
20	0.	230	0.	3454	0.	0.	0.
22	0.	250	0.	3760	0.	0.	0.
24	0.	271	0.	4065	0.	0.	0.
26	0.	291	0.	4370	0.	0.	0.
28	0.	311	0.	4676	0.	0.	0.
TOTALS				TOTALS			
IMC	0.02E-08	5.73E-06	1.73E-05	9.09E-07	1.73E-05	9.09E-07	1.73E-05
WED	0	42	23	8	191	24	24

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17115100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	7.66E+06	26	8.60E+04	1.04E+00	3.62	3.62
3	0.	47	2.26E+04	0.	706	706
5	0.	67	3.53E+03	0.	1316	1316
7	0.	87	0.	0.	1622	1622
9	0.	108	2.06E+03	0.	1927	1927
11	0.	128	0.	0.	2233	2233
12	2.25E+05	148	0.	0.	2538	2538
14	6.52E+05	169	0.	0.	2843	2843
16	2.25E+05	189	0.	0.	3149	3149
19	0.	209	0.	0.	3454	3454
21	0.	230	0.	0.	3761	3761
23	0.	250	0.	0.	4065	4065
25	0.	271	0.	0.	4370	4370
27	0.	291	0.	0.	4676	4676
TOTALS					ALT	ALT
INC	2.73E-06	14	2.87E-05	1.40E-06	3.01E-05	3.01E-05
MEAN	0	0	0	0	0	0

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17115100

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17115100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	5.08E+06	26	5.71E+04	1.10E+00	3.62	3.62
3	0.	47	0.	0.	706	706
5	0.	67	0.	0.	1316	1316
7	0.	87	0.	0.	1622	1622
9	0.	108	2.06E+03	0.	1927	1927
11	0.	128	0.	0.	2233	2233
12	0.	148	0.	0.	2538	2538
14	0.	169	0.	0.	2843	2843
16	0.	189	0.	0.	3149	3149
19	0.	209	0.	0.	3454	3454
21	0.	230	0.	0.	3761	3761
23	0.	250	0.	0.	4065	4065
25	0.	271	0.	0.	4370	4370
27	0.	291	0.	0.	4676	4676
TOTALS					ALT	ALT
INC	7.04E-06	2	1.32E-05	9.36E-07	1.42E-05	1.42E-05
MEAN	0	0	0	0	0	0

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17115100

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17117000

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	5.79E+06	26	1.70E+05	2.71E+00	3.62	3.62
3	0.	47	0.	0.	706	706
5	0.	67	0.	0.	1316	1316
7	0.	87	0.	0.	1622	1622
9	0.	108	4.25E+03	0.	1927	1927
11	0.	128	0.	0.	2233	2233
12	0.	148	0.	0.	2538	2538
14	0.	169	0.	0.	2843	2843
16	0.	189	0.	0.	3149	3149
19	0.	209	0.	0.	3454	3454
21	0.	230	0.	0.	3761	3761
23	0.	250	0.	0.	4065	4065
25	0.	271	0.	0.	4370	4370
27	0.	291	0.	0.	4676	4676
TOTALS					ALT	ALT
INC	5.39E-06	2	1.45E-05	2.32E-06	3.26E-05	3.26E-05
MEAN	0	0	0	0	0	0

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17117000

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17117000

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	5.78E+06	26	1.41E+05	3.26E+00	3.63	3.63
3	0.	47	0.	0.	706	706
5	0.	67	3.49E+03	0.	1316	1316
7	0.	87	0.	0.	1622	1622
9	0.	108	0.	0.	1927	1927
11	0.	128	0.	0.	2233	2233
12	0.	148	0.	0.	2538	2538
14	0.	169	0.	0.	2843	2843
16	0.	189	0.	0.	3149	3149
19	0.	209	0.	0.	3454	3454
21	0.	230	0.	0.	3761	3761
23	0.	250	0.	0.	4065	4065
25	0.	271	0.	0.	4370	4370
27	0.	291	0.	0.	4676	4676
TOTALS					ALT	ALT
INC	5.04E-06	2	2.08E-05	2.78E-06	2.36E-05	2.36E-05
MEAN	0	0	0	0	0	0

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17117000



AFWL CIPRUS STUDY BY AFGL  
FLIGHT E70-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17156J00

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MMB)	
SIZE (μM)	SCATTER PROBE	SIZE (μM)	PRECIP PROBE	ALT	KHM
2	1.64E+09	26	3	437	0.
3	3.53E+07	47	0.	716	0.
5	0.	67	0.	1311	0.
7	0.	87	0.	1716	0.
9	0.	199	0.	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	1.	2733	7.
14	0.	160	0.	2730	0.
15	0.	189	0.	7443	0.
15	0.	219	0.	7149	0.
19	0.	230	0.	3654	0.
21	0.	250	0.	3781	0.
23	0.	271	0.	4765	0.
25	0.	291	0.	4774	0.
27	0.	311	0.	4676	0.
				Z 0.	
				FORM	FG.00
				NT(N/M**3)	
					0.

INC	1.63E-05	0.	0	TOTALS
4E0	2	0.	0	

AFWL CRODUS STUDY BY AFGL  
FLIGHT# 478-16 IN 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17156130

PARTICLE SIZE DISTRIBUTIONS (NUMBERS/M <sup>3</sup> -M)			CLOUD			PRECIP			PRESS (MMB)		
SIZE (μU)	SCATTER PROBE	SIZE (μU)	SIZE (μU)	PROBE	SIZE (μU)	PROBE	SIZE (μU)	PROBE	ALT	(KM)	
2	1.5E+09	26	0.	0.	437	0.			ALT	8.92	
3	3.1E+07	47	0.	0.	706	0.			T	-42.22C	
5	0.	67	0.	0.	1111	0.			FPT	-45.7C	
7	0.	87	0.	0.	1715	0.			IAS	(M/S)	
9	0.	100	0.	0.	1622	0.				123.55	
11	0.	129	0.	0.	1927	0.			Z	0.	
12	0.	140	0.	0.	2233	0.			FOR	F8.0U	
14	0.	169	0.	0.	2538	0.			NT	(V/M=0.3)	
15	0.	189	0.	0.	2843	0.				0.	
19	0.	209	0.	0.	3149	0.					
21	0.	230	0.	0.	3454	0.					
23	1.	250	0.	0.	3760	0.					
25	0.	271	0.	0.	4065	0.					
27	0.	291	0.	0.	4370	0.					
29	0.	311	0.	0.	4676	0.					

	1.50E-05	0.	0.	TOTALS
WMC	2	0	0	0.
VED	0	0	0	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17157102

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP (MB)
2	1.53E+09	26	0.	437	0.
3	3.13E+07	47	0.	706	0.
5	0.	67	0.	1011	0.
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	0.
14	0.	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				0.	0.
IMC	1.51E-05	0.	0.	0.	0.
410 D	2	0	0	0	0

IMC 410 D 2 0 0 0 0 0

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17157133

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP (MB)
2	1.62E+09	26	0.	437	0.
3	3.35E+07	47	0.	706	0.
5	0.	67	0.	1011	0.
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	0.
14	0.	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				0.	0.
IMC	1.59E-05	0.	0.	0.	0.
410 D	2	0	0	0	0

IMC 410 D 2 0 0 0 0 0

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17158102

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP (MB)
2	1.60E+09	26	0.	437	0.
3	2.77E+07	47	0.	706	0.
5	0.	67	0.	1011	0.
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	0.
14	0.	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				0.	0.
IMC	1.54E-05	0.	0.	0.	0.
410 D	2	0	0	0	0

IMC 410 D 2 0 0 0 0 0

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17158133

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP (MB)
2	1.67E+09	26	0.	437	0.
3	3.26E+07	47	0.	706	0.
5	5.32E+05	67	0.	1011	0.
7	1.06E+06	87	0.	1316	0.
9	0.	108	0.	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	0.
14	0.	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				0.	0.
IMC	2.16E-05	0.	0.	0.	0.
410 D	2	0	0	0	0

IMC 410 D 2 0 0 0 0 0

AFWL CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17459103

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	
2	1.69E+09	26	0.	437	5.20E+00
3	3.77E+07	47	5.36E+04	706	0.
5	1.07E+06	67	0.	1011	0.
7	1.60E+06	87	4.99E+03	1316	0.
9	0.	109	1.39E+03	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	9.86E+02	2233	0.
14	3.32E+02	169	2.85E+03	2538	0.
15	2.86E+05	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3763	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				ALT (KM)	
IMC	2.02E-05	5.16E-05	4.45E-06	309.67	
MEAN	2	5	191	ALT (KM)	

AFWL CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18100103

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	
2	1.60E+09	26	3.45E+04	437	3.
3	4.66E+07	47	1.37E+05	706	3.
5	2.73E+06	67	1.71E+04	1011	0.
7	5.10E+06	87	2.04E+04	1316	0.
9	3.04E+06	108	1.38E+04	1622	0.
11	1.36E+06	128	1.16E+04	1927	0.
12	1.64E+06	148	7.00E+03	2233	0.
14	3.17E+05	169	3.33E+03	2538	0.
15	5.12E+05	189	1.81E+03	2843	0.
18	8.19E+15	209	9.81E+02	3149	0.
19	1.63E+06	230	1.05E+03	3454	0.
21	5.46E+05	250	1.20E+03	3763	0.
23	5.46E+05	271	0.	4065	0.
25	1.9E+06	291	0.	4370	0.
27	5.46E+05	311	0.	4676	0.
TOTALS				ALT (KM)	
IMC	3.67E-05	2.57E-04	0.	307.25	
MEAN	20	4	0	ALT (KM)	

AFWL CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17459103

PARTICLE SIZE DISTRIBUTION: (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	
2	1.45E+09	26	0.	437	1.3E+00
3	4.12E+07	47	1.76E+05	706	0.
5	7.50E+06	67	4.24E+03	1011	0.
7	5.43E+05	87	7.61E+03	1316	0.
9	1.36E+06	108	1.48E+04	1622	0.
11	1.35E+06	128	1.15E+04	1927	0.
12	1.91E+06	148	1.41E+04	2233	0.
14	5.42E+05	169	5.80E+03	2538	0.
15	2.10E+06	189	9.06E+03	2843	0.
19	3.84E+07	209	9.80E+02	3149	0.
19	7.03E+06	230	1.07E+03	3454	0.
21	8.15E+05	250	0.	3763	0.
23	1.08E+06	271	0.	4065	0.
25	2.7E+06	291	0.	4370	0.
27	1.69E+06	311	0.	4676	0.
TOTALS				ALT (KM)	
IMC	3.95E-04	2.87E-04	1.13E-06	36.85	
MEAN	16	7	191	ALT (KM)	

AFWL CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18100103

PARTICLE SIZE DISTRIBUTIONS (NUMBER/CM**3-MM)				PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD SCROPE	SIZE (UM)	PRECIP PROBE
2	1.76E+09	26	9.	437	1.32E+02
3	4.10E+07	47	7.70E+04	705	5.29E-01
5	1.63E+06	67	4.26E+03	1011	0.
7	5.41E+05	87	2.55E+03	1316	0.
9	1.09E+06	108	9.	1522	0.
11	2.71E+05	128	0.	1927	0.
12	5.46E+05	148	1.01E+03	2233	0.
14	5.42E+05	169	1.67E+03	2538	0.
15	8.18E+05	189	9.01E+02	2843	0.
19	2.71E+05	209	9.83E+02	3149	0.
19	0.	230	4.31E+03	3454	0.
21	3.42E+05	250	0.	3760	0.
23	5.41E+05	271	7.51E+02	4065	0.
25	4.71E+05	291	1.50E+03	4370	0.
27	5.42E+05	311	1.07E+03	4676	0.
TOTALS				ALT (KM)	
IMC	3.25E-05	1.85E-04	0.86E-05	36.75	
MEAN	16	12	192	ALT (KM)	

AFML CIPRUS STUDY BY AFGL  
 FLIGHT 178-16 JN 4 APR 78 30 SECOND AVERAGING  
 TYPE1 RULL-ROSE INTERVAL START: 1800100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	PRECIP PROBE	ALT (KM)	TOTALS
2	1.81E+09	26	0.	437	0.	9.01	0.
3	1.87E+07	47	0.	706	0.	T -43.75C	0.
5	0.	67	0.	1311	0.	FPT -43.3C	0.
7	0.	87	0.	1315	0.	TAS (M/S)	0.
9	0.	108	0.	1622	0.	125.09	0.
11	0.	128	0.	1927	0.	Z 0.	0.
12	0.	148	0.	2233	0.	FORN FL.00	0.
14	0.	169	0.	2538	0.	NT(N/M**3)	0.
16	0.	189	0.	2843	0.	0.	0.
18	0.	209	0.	3149	0.	TOTALS	0.
20	0.	229	0.	3454	0.	IMC 1.0E-05	0.
22	0.	250	0.	3760	0.	4E0 0	0.
24	0.	271	0.	4065	0.	1.0E-05	0.
26	0.	291	0.	4370	0.	2	0.
28	0.	311	0.	4676	0.	1.0E-05	0.
30	0.	331	0.	4982	0.	1.0E-05	0.
32	0.	351	0.	5288	0.	1.0E-05	0.
34	0.	371	0.	5594	0.	1.0E-05	0.
36	0.	391	0.	5900	0.	1.0E-05	0.
38	0.	411	0.	6206	0.	1.0E-05	0.
40	0.	431	0.	6512	0.	1.0E-05	0.
42	0.	451	0.	6818	0.	1.0E-05	0.
44	0.	471	0.	7124	0.	1.0E-05	0.
46	0.	491	0.	7430	0.	1.0E-05	0.
48	0.	511	0.	7736	0.	1.0E-05	0.
50	0.	531	0.	8042	0.	1.0E-05	0.
52	0.	551	0.	8348	0.	1.0E-05	0.
54	0.	571	0.	8654	0.	1.0E-05	0.
56	0.	591	0.	8960	0.	1.0E-05	0.
58	0.	611	0.	9266	0.	1.0E-05	0.
60	0.	631	0.	9572	0.	1.0E-05	0.
62	0.	651	0.	9878	0.	1.0E-05	0.
64	0.	671	0.	10184	0.	1.0E-05	0.
66	0.	691	0.	10490	0.	1.0E-05	0.
68	0.	711	0.	10796	0.	1.0E-05	0.
70	0.	731	0.	11102	0.	1.0E-05	0.
72	0.	751	0.	11408	0.	1.0E-05	0.
74	0.	771	0.	11714	0.	1.0E-05	0.
76	0.	791	0.	12020	0.	1.0E-05	0.
78	0.	811	0.	12326	0.	1.0E-05	0.
80	0.	831	0.	12632	0.	1.0E-05	0.
82	0.	851	0.	12938	0.	1.0E-05	0.
84	0.	871	0.	13244	0.	1.0E-05	0.
86	0.	891	0.	13550	0.	1.0E-05	0.
88	0.	911	0.	13856	0.	1.0E-05	0.
90	0.	931	0.	14162	0.	1.0E-05	0.
92	0.	951	0.	14468	0.	1.0E-05	0.
94	0.	971	0.	14774	0.	1.0E-05	0.
96	0.	991	0.	15080	0.	1.0E-05	0.
98	0.	1011	0.	15386	0.	1.0E-05	0.
100	0.	1031	0.	15692	0.	1.0E-05	0.
102	0.	1051	0.	15998	0.	1.0E-05	0.
104	0.	1071	0.	16304	0.	1.0E-05	0.
106	0.	1091	0.	16610	0.	1.0E-05	0.
108	0.	1111	0.	16916	0.	1.0E-05	0.
110	0.	1131	0.	17222	0.	1.0E-05	0.
112	0.	1151	0.	17528	0.	1.0E-05	0.
114	0.	1171	0.	17834	0.	1.0E-05	0.
116	0.	1191	0.	18140	0.	1.0E-05	0.
118	0.	1211	0.	18446	0.	1.0E-05	0.
120	0.	1231	0.	18752	0.	1.0E-05	0.
122	0.	1251	0.	19058	0.	1.0E-05	0.
124	0.	1271	0.	19364	0.	1.0E-05	0.
126	0.	1291	0.	19670	0.	1.0E-05	0.
128	0.	1311	0.	19976	0.	1.0E-05	0.
130	0.	1331	0.	20282	0.	1.0E-05	0.
132	0.	1351	0.	20588	0.	1.0E-05	0.
134	0.	1371	0.	20894	0.	1.0E-05	0.
136	0.	1391	0.	21200	0.	1.0E-05	0.
138	0.	1411	0.	21506	0.	1.0E-05	0.
140	0.	1431	0.	21812	0.	1.0E-05	0.
142	0.	1451	0.	22118	0.	1.0E-05	0.
144	0.	1471	0.	22424	0.	1.0E-05	0.
146	0.	1491	0.	22730	0.	1.0E-05	0.
148	0.	1511	0.	23036	0.	1.0E-05	0.
150	0.	1531	0.	23342	0.	1.0E-05	0.
152	0.	1551	0.	23648	0.	1.0E-05	0.
154	0.	1571	0.	23954	0.	1.0E-05	0.
156	0.	1591	0.	24260	0.	1.0E-05	0.
158	0.	1611	0.	24566	0.	1.0E-05	0.
160	0.	1631	0.	24872	0.	1.0E-05	0.
162	0.	1651	0.	25178	0.	1.0E-05	0.
164	0.	1671	0.	25484	0.	1.0E-05	0.
166	0.	1691	0.	25790	0.	1.0E-05	0.
168	0.	1711	0.	26096	0.	1.0E-05	0.
170	0.	1731	0.	26402	0.	1.0E-05	0.
172	0.	1751	0.	26708	0.	1.0E-05	0.
174	0.	1771	0.	27014	0.	1.0E-05	0.
176	0.	1791	0.	27320	0.	1.0E-05	0.
178	0.	1811	0.	27626	0.	1.0E-05	0.
180	0.	1831	0.	27932	0.	1.0E-05	0.
182	0.	1851	0.	28238	0.	1.0E-05	0.
184	0.	1871	0.	28544	0.	1.0E-05	0.
186	0.	1891	0.	28850	0.	1.0E-05	0.
188	0.	1911	0.	29156	0.	1.0E-05	0.
190	0.	1931	0.	29462	0.	1.0E-05	0.
192	0.	1951	0.	29768	0.	1.0E-05	0.
194	0.	1971	0.	30074	0.	1.0E-05	0.
196	0.	1991	0.	30380	0.	1.0E-05	0.
198	0.	2011	0.	30686	0.	1.0E-05	0.
200	0.	2031	0.	30992	0.	1.0E-05	0.
202	0.	2051	0.	31298	0.	1.0E-05	0.
204	0.	2071	0.	31604	0.	1.0E-05	0.
206	0.	2091	0.	31910	0.	1.0E-05	0.
208	0.	2111	0.	32216	0.	1.0E-05	0.
210	0.	2131	0.	32522	0.	1.0E-05	0.
212	0.	2151	0.	32828	0.	1.0E-05	0.
214	0.	2171	0.	33134	0.	1.0E-05	0.
216	0.	2191	0.	33440	0.	1.0E-05	0.
218	0.	2211	0.	33746	0.	1.0E-05	0.
220	0.	2231	0.	34052	0.	1.0E-05	0.
222	0.	2251	0.	34358	0.	1.0E-05	0.
224	0.	2271	0.	34664	0.	1.0E-05	0.
226	0.	2291	0.	34970	0.	1.0E-05	0.
228	0.	2311	0.	35276	0.	1.0E-05	0.
230	0.	2331	0.	35582	0.	1.0E-05	0.
232	0.	2351	0.	35888	0.	1.0E-05	0.
234	0.	2371	0.	36194	0.	1.0E-05	0.
236	0.	2391	0.	36500	0.	1.0E-05	0.
238	0.	2411	0.	36806	0.	1.0E-05	0.
240	0.	2431	0.	37112	0.	1.0E-05	0.
242	0.	2451	0.	37418	0.	1.0E-05	0.
244	0.	2471	0.	37724	0.	1.0E-05	0.
246	0.	2491	0.	38030	0.	1.0E-05	0.
248	0.	2511	0.	38336	0.	1.0E-05	0.
250	0.	2531	0.	38642	0.	1.0E-05	0.
252	0.	2551	0.	38948	0.	1.0E-05	0.
254	0.	2571	0.	39254	0.	1.0E-05	0.
256	0.	2591	0.	39560	0.	1.0E-05	0.
258	0.	2611	0.	39866	0.	1.0E-05	0.
260	0.	2631	0.	40172	0.	1.0E-05	0.
262	0.	2651	0.	40478	0.	1.0E-05	0.
264	0.	2671	0.	40784	0.	1.0E-05	0.
266	0.	2691	0.	41090	0.	1.0E-05	0.
268	0.	2711	0.	41396	0.	1.0E-05	0.
270	0.	2731	0.	41702	0.	1.0E-05	0.
272	0.	2751	0.	42008	0.	1.0E-05	0.
274	0.	2771	0.	42314	0.	1.0E-05	0.
276	0.	2791	0.	42620	0.	1.0E-05	0.
278	0.	2811	0.	42926	0.	1.0E-05	0.
280	0.	2831	0.	43232	0.	1.0E-05	0.
282	0.	2851	0.	43538	0.	1.0E-05	0.
284	0.	2871	0.	43844	0.	1.0E-05	0.
286	0.	2891	0.	44150	0.	1.0E-05	0.
288	0.	2911	0.	44456	0.	1.0E-05	0.
290	0.	2931	0.	44762	0.	1.0E-05	0.
292	0.	2951	0.	45068	0.	1.0E-05	0.
294	0.	2971	0.	45374	0.	1.0E-05	0.
296	0.	2991	0.	45680	0.	1.0E-05	0.
298	0.	3011	0.	45986	0.	1.0E-05	0.
300	0.	3031	0.	46292	0.	1.0E-05	0.
302	0.	3051	0.	46598	0.	1.0E-05	0.
304	0.	3071	0.	46904	0.	1.0E-05	0.
306	0.	3091	0.	47210	0.	1.0E-05	0.
308	0.	3111	0.	47516	0.	1.0E-05	0.
310	0.	3131	0.	47822	0.	1.0E-05	0.
312	0.	3151	0.	48128	0.	1.0E-05	0.
314	0.	3171	0.	48434	0.	1.0E-05	0.
316	0.	3191	0.	48740	0.	1.0E-05	0.
318	0.	3211	0.	49046	0.	1.0E-05	0.
320	0.	3231	0.	49352	0.	1.0E-05	0.
322	0.	3251	0.	49658	0.	1.0E-05	0.
324	0.	3271	0.	49964	0.	1.0E-05	0.
326	0.	3291	0.	50270	0.	1.0E-05	0.
328	0.	3311	0.	50576	0.	1.0E-05	0.
330	0.	3331	0.	50882	0.	1.0E-05	0.
332	0.	3351	0.	51188	0.	1.0E-05	0.
334	0.	3371	0.	51494	0.	1.0E-05	0.
336	0.	3391	0.	51800	0.	1.0E-05	0.
338	0.	3411	0.	52106	0.	1.0E-05	0.
340	0.	3431	0.	52412	0.	1.0E-05	0.
342	0.	3451	0.	52718	0.	1.0E-05	0.
344	0.	3471	0.	53024	0.	1.0E-05	0.
346	0.	3491	0.	53330	0.	1.0E-05	0.
348	0.	3511	0.	53636	0.	1.0E-05	0.
350	0.	3531	0.	53942	0.	1.0E-05	0.
352	0.	3551	0.	54248	0.	1.0E-05	0.
354	0.	3571					

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 75 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18103100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (μ)	SCATTER PROBE	SIZE (μ)	SIZE (μ)	ALT (KM)	PRESS (MB)
2	2.00E+09	26	0.	9.02	306.34
3	4.58E+07	47	0.		
5	0.	101	0.	T -43.74C	
7	0.	1316	0.		
9	0.	1422	0.	FPT -44.7C	
11	0.	128	0.	TAS (M/S)	
12	0.	146	0.	20.12	
14	0.	169	0.		
15	0.	209	0.	2.44E-05	
19	0.	236	0.	FORM F1.00	
21	0.	250	0.	NT(N/M <sup>3</sup> )	
23	0.	271	0.	8.92E-01	
25	0.	291	0.	TOTALS	
27	0.	311	0.		
IMC	1.99E-03			1.29E-06	3.29E-06
4ED	2			191	191

51

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 75 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18103100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (μ)	SCATTER PROBE	SIZE (μ)	SIZE (μ)	ALT (KM)	PRESS (MB)
2	4.04E+06	26	0.	9.01	306.50
3	4.7E+01	47	0.		
5	0.	101	0.	T -43.82C	
7	0.	1316	0.		
9	0.	1522	0.	FPT -44.4C	
11	0.	128	0.	TAS (M/S)	
12	0.	146	0.	128.36	
14	0.	169	0.		
15	0.	209	0.	2.5.93E-05	
19	0.	230	0.	FORM F1.00	
21	0.	250	0.	NT(N/M <sup>3</sup> )	
23	0.	271	0.	1.1935E+00	
25	0.	291	0.	TOTALS	
27	0.	311	0.		
IMC	2.83E-05			4.40E-06	4.40E-06
4ED	2			191	191

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 75 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18104100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (μ)	SCATTER PROBE	SIZE (μ)	SIZE (μ)	ALT (KM)	PRESS (MB)
2	2.23E+09	26	0.	9.01	306.96
3	4.94E+07	47	0.		
5	0.	101	0.	T -43.52C	
7	0.	1316	0.		
9	0.	1622	0.	FPT -43.8C	
11	0.	128	0.	TAS (M/S)	
12	0.	146	0.	128.29	
14	0.	169	0.		
15	0.	209	0.	2.3.70E-05	
19	0.	231	0.	FORM F1.00	
21	0.	250	0.	NT(N/M <sup>3</sup> )	
23	0.	271	0.	7.4555E-01	
25	0.	291	0.	TOTALS	
27	0.	311	0.		
IMC	2.22E-05			2.75E-06	2.75E-06
4ED	2			191	191

52

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 75 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18104100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (μ)	SCATTER PROBE	SIZE (μ)	SIZE (μ)	ALT (KM)	PRESS (MB)
2	2.25E+19	26	0.	9.02	306.23
3	4.35E+07	47	0.		
5	0.	101	0.	T -43.78C	
7	0.	1316	0.		
9	0.	1522	0.	FPT -43.4C	
11	0.	128	0.	TAS (M/S)	
12	0.	146	0.	127.82	
14	0.	169	0.		
15	0.	209	0.	2.2.97E-05	
19	0.	230	0.	FORM F1.00	
21	0.	250	0.	NT(N/M <sup>3</sup> )	
23	0.	271	0.	5.9784E-01	
25	0.	291	0.	TOTALS	
27	0.	311	0.		
IMC	2.20E-05			2.21E-06	2.21E-06
4ED	2			191	191

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10105100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	PRECIP PROBE	ALT (K)	PRESS (MB)
2	2.27E+09	26	3.18E+04	5.17E+00	9.11	305.44
3	4.59E+07	47	2.66E+04	3.0		
5	1.32E+06	67	0.	0.	T -43.87C	
7	2.68E+05	87	0.	0.		
9	2.64E+05	104	1.69E+03	0.	FRT -43.9C	
11	7.99E+04	128	0.	0.		
12	2.64E+05	148	1.97E+03	0.	TAS (M/S)	
14	0.	169	9.04E+02	0.	120.45	
16	9.27E+05	188	1.74E+03	0.	Z 8.37E-05	
18	0.	209	0.	0.		
19	0.	230	0.	0.	FORM F .34	
21	0.	250	0.	0.	MT(N/M <sup>3</sup> )	
23	2.64E+05	271	0.	0.	6.6857E+02	
25	0.	291	0.	0.		
27	0.	311	0.	0.		
IMC	2.96E-05	1.72E+05	1.72E+05	4.42E+06	TOTALS	
410 0	2	79	191	301	4.16E-05	74

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10105130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	PRECIP PROBE	ALT (K)	PRESS (MB)
2	2.24E+09	26	3.18E+04	5.17E+00	9.10	302.85
3	4.59E+07	47	2.66E+04	3.0		
5	2.97E+06	67	0.	0.	T -44.10C	
7	3.24E+06	87	0.	0.		
9	3.10E+05	104	1.69E+03	0.	FRT -43.6C	
11	5.09E+05	128	0.	0.		
12	1.77E+06	148	9.04E+02	0.	TAS (M/S)	
14	2.10E+06	169	0.	0.	125.80	
16	2.66E+05	188	0.	0.	Z 1.54E-04	
18	0.	209	0.	0.		
19	0.	230	0.	0.	FORM F .25	
21	2.71E+05	250	0.	0.	MT(N/M <sup>3</sup> )	
23	8.13E+05	271	0.	0.	2.8790E+02	
25	2.57E+05	291	0.	0.		
27	2.06E+05	311	0.	0.		
IMC	5.79E-05	1.72E+05	1.72E+05	2.71E+06	TOTALS	
410 0	14	59	301	301	2.71E-05	68

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10105100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	PRECIP PROBE	ALT (K)	PRESS (MB)
2	2.58E+09	26	0.	6.67E-01	9.12	301.61
3	5.08E+07	47	0.	0.		
5	2.46E+06	67	0.	0.	T -44.20C	
7	2.73E+06	87	0.	0.		
9	1.64E+06	104	5.11E+03	0.	FRT -43.4C	
11	8.25E+05	128	0.	0.		
12	2.74E+05	148	0.	0.	TAS (M/S)	
14	2.74E+05	169	0.	0.	124.02	
16	1.64E+06	188	0.	0.	Z 1.45E-05	
18	9.21E+05	209	0.	0.		
19	1.09E+06	230	0.	0.	FORM F .53	
21	0.	250	0.	0.	MT(N/M <sup>3</sup> )	
23	8.19E+05	271	0.	0.	9.5520E+02	
25	2.72E+05	291	0.	0.		
27	2.74E+05	311	0.	0.		
IMC	5.85E-05	1.24E+05	1.24E+05	9.74E+07	TOTALS	
410 0	16	45	191	191	3.30E-05	45

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10105130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	PRECIP PROBE	ALT (K)	PRESS (MB)
2	2.53E+09	26	0.	437	9.15	300.57
3	5.08E+07	47	0.	706		
5	1.10E+06	67	0.	1811	T -44.18C	
7	2.74E+05	87	2.56E+03	1716		
9	0.	104	0.	1622	FRT -43.0C	
11	8.21E+05	128	0.	1927		
12	5.46E+05	148	0.	2233	TAS (M/S)	
14	0.	169	0.	2538	123.86	
16	2.74E+05	188	0.	2843	Z 8.66E-07	
18	2.74E+05	209	0.	3149		
19	2.73E+05	230	0.	3454	FORM F 1.00	
21	2.74E+05	250	0.	3760	MT(N/M <sup>3</sup> )	
23	0.	271	0.	4065	9.2133E+01	
25	2.74E+05	291	0.	4370		
27	2.74E+05	311	0.	4676		
IMC	5.94E-05	3.52E+06	3.52E+06	59	TOTALS	
410 0	2	59	59	59	3.52E-06	59

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18107100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.50E+09	26	3.44E+04	437	9.15	300.26
3	4.78E+07	47	1.80E+04	706		
5	5.43E+05	67	4.28E+03	1011	T -44.44C	
7	1.36E+06	87	5.10E+03	1316		
9	2.72E+05	108	8.62E+03	1622	FPT -42.6C	
11	2.72E+05	128	1.28E+03	1927		
12	9.15E+05	148	0.	2233	TAS (M/S)	
14	1.36E+06	169	0.	2538	124.64	
15	5.44E+05	189	0.	2843		
19	5.44E+05	239	0.	3149	Z 1.11E-05	
13	8.13E+05	237	0.	3454	FORM F 1.06	
21	2.72E+05	259	0.	3760		
23	5.44E+05	271	0.	4065	NT(N/M*3)	
25	3.15E+05	291	0.	4370	3.9254E+02	
27	0.	311	0.	4576		
TOTALS						
IMC	0.38E-05	3.66E-05	0.	0.	3.66E-05	55
4ED 0	16	55				

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18107133

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.57E+09	26	6.06E+04	437	9.15	300.48
3	5.39E+07	47	1.80E+04	706		
5	1.08E+06	67	4.28E+03	1011	I -44.44C	
7	1.35E+06	87	5.10E+03	1316		
9	1.01E+06	108	8.62E+03	1622	FPT -42.5C	
11	1.08E+06	128	0.	1927		
12	3.10E+05	148	0.	2233	TAS (M/S)	
14	0.	169	0.	2538	125.77	
15	0.	189	0.	2843		
19	1.35E+06	209	0.	3149	Z 1.48E-05	
13	2.43E+06	230	0.	3454	FORM F .99	
21	0.	250	0.	3760		
23	2.70E+05	271	0.	4065	NT(N/M*3)	
25	2.70E+05	291	0.	4370	8.5106E+02	
27	5.39E+05	311	0.	4576		
TOTALS						
IMC	7.25E-05	5.83E-05	0.	0.	5.83E-05	54
4ED 0	16	54				

CU

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18108103

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.57E+09	26	1.02E+05	437	9.15	300.54
3	5.62E+07	47	8.95E+03	706		
5	1.87E+06	67	0.	1011	T -44.43C	
7	1.87E+06	87	0.	1316		
9	1.34E+06	108	1.19E+04	1622	FPT -42.6C	
11	9.02E+05	128	7.78E+03	1927		
12	0.	148	0.	2233	TAS (M/S)	
14	5.36E+05	169	0.	2538	126.64	
15	5.36E+05	189	0.	2843		
19	5.36E+05	209	0.	3149	Z 2.58E-05	
13	1.35E+06	230	0.	3454	FORM F .56	
21	0.	250	0.	3760		
23	0.	271	0.	4065	NT(N/M*3)	
25	2.67E+05	291	0.	4370	5.0312E+02	
27	2.68E+05	311	0.	4576		
TOTALS						
IMC	5.46E-05	5.25E-05	0.	0.	5.46E-05	57
4ED 0	9	57				

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18108133

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M*3-MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.66E+09	26	0.	437	9.15	300.29
3	5.03E+07	47	0.	706		
5	7.97E+05	67	9.30E+03	1011	T -44.50C	
7	3.28E+05	87	2.47E+03	1316		
9	5.29E+05	108	6.72E+03	1622	FPT -42.7C	
11	0.	128	3.73E+03	1927		
12	2.64E+05	148	0.	2233	TAS (M/S)	
14	3.08E+05	169	0.	2538	127.94	
16	7.94E+05	189	0.	2843		
13	0.	209	0.	3149	Z 2.03E-05	
19	0.	230	0.	3454	FORM F .73	
21	0.	250	0.	3760		
23	0.	271	0.	4065	NT(N/M*3)	
25	2.66E+05	291	0.	4370	4.3235E+02	
27	0.	311	0.	4576		
TOTALS						
IMC	3.60E-05	3.52E-05	0.	0.	3.52E-05	58
4ED 0	2	58				

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 181000

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	ALT (KM)
2	2.57E+09	26	0.	437	6.4DE-01
3	6.59E+07	47	4.40E+04	706	0.
5	3.94E+06	67	4.14E+03	1311	0.
7	3.41E+06	67	4.91E+03	1316	0.
9	2.35E+06	108	2.01E+04	1522	0.
11	2.89E+06	128	1.11E+04	1927	0.
12	2.36E+06	148	6.82E+03	2233	0.
14	1.58E+06	169	4.82E+03	2538	0.
15	1.31E+06	189	6.07E+03	2843	0.
16	2.63E+05	209	9.45E+02	3149	0.
19	5.24E+05	230	0.	3454	0.
21	5.27E+05	250	4.63E+03	3760	0.
23	7.85E+05	271	1.42E+03	4165	0.
25	5.25E+05	291	4.34E+02	4370	0.
27	1.05E+06	311	1.33E+02	4676	0.
IMC	3.50E-05	17	3.04E-04	61	81
4ED D	17				
TOTALS					

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 181000

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	ALT (KM)
2	2.57E+09	26	0.	437	5.12E+00
3	6.59E+07	47	4.40E+04	706	0.
5	3.94E+06	67	4.14E+03	1311	0.
7	3.41E+06	67	4.91E+03	1316	0.
9	2.35E+06	108	2.01E+04	1522	0.
11	2.89E+06	128	1.11E+04	1927	0.
12	2.36E+06	148	6.82E+03	2233	0.
14	1.58E+06	169	4.82E+03	2538	0.
15	1.31E+06	189	6.07E+03	2843	0.
16	2.63E+05	209	9.45E+02	3149	0.
19	5.24E+05	230	0.	3454	0.
21	5.27E+05	250	4.63E+03	3760	0.
23	7.85E+05	271	1.42E+03	4165	0.
25	5.25E+05	291	4.34E+02	4370	0.
27	1.05E+06	311	1.33E+02	4676	0.
IMC	3.50E-05	17	3.04E-04	61	81
4ED D	17				
TOTALS					

50

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 181000

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	ALT (KM)
2	2.57E+09	26	0.	437	6.4DE-01
3	6.59E+07	47	4.40E+04	706	0.
5	3.94E+06	67	4.14E+03	1311	0.
7	3.41E+06	67	4.91E+03	1316	0.
9	2.35E+06	108	2.01E+04	1522	0.
11	2.89E+06	128	1.11E+04	1927	0.
12	2.36E+06	148	6.82E+03	2233	0.
14	1.58E+06	169	4.82E+03	2538	0.
15	1.31E+06	189	6.07E+03	2843	0.
16	2.63E+05	209	9.45E+02	3149	0.
19	5.24E+05	230	0.	3454	0.
21	5.27E+05	250	4.63E+03	3760	0.
23	7.85E+05	271	1.42E+03	4165	0.
25	5.25E+05	291	4.34E+02	4370	0.
27	1.05E+06	311	1.33E+02	4676	0.
IMC	3.50E-05	17	3.04E-04	61	81
4ED D	17				
TOTALS					

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 181000

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	ALT (KM)
2	2.57E+09	26	0.	437	5.12E+00
3	6.59E+07	47	4.40E+04	706	0.
5	3.94E+06	67	4.14E+03	1311	0.
7	3.41E+06	67	4.91E+03	1316	0.
9	2.35E+06	108	2.01E+04	1522	0.
11	2.89E+06	128	1.11E+04	1927	0.
12	2.36E+06	148	6.82E+03	2233	0.
14	1.58E+06	169	4.82E+03	2538	0.
15	1.31E+06	189	6.07E+03	2843	0.
16	2.63E+05	209	9.45E+02	3149	0.
19	5.24E+05	230	0.	3454	0.
21	5.27E+05	250	4.63E+03	3760	0.
23	7.85E+05	271	1.42E+03	4165	0.
25	5.25E+05	291	4.34E+02	4370	0.
27	1.05E+06	311	1.33E+02	4676	0.
IMC	3.50E-05	17	3.04E-04	61	81
4ED D	17				
TOTALS					



AFML CIRRUS STUDY BY AFGL  
 FLIGHT 570-16 ON 4 APR 78 30 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 10112100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	PRESS (MB)
2	3.04E+09	26	3.40E+04	437	1.28E+00	9.28	29.72
3	5.80E+07	47	8.95E+03	706	2.07E+00		
5	5.35E+05	67	0.	1011	0.	T -45.67C	
7	3.02E+05	87	0.	1316	0.	FPT -43.7C	
9	9.03E+05	108	1.70E+03	1622	0.	TAS (M/S)	
11	8.03E+05	128	0.	1927	0.	126.66	
12	5.35E+05	148	0.	2233	0.		
14	2.67E+05	169	0.	2538	0.	2 5.71E-04	
15	5.35E+05	189	0.	3149	0.	FORM F .12	
19	2.67E+05	230	0.	3454	0.	NT(N/M**3)	
21	2.67E+05	250	0.	3760	0.	2.1795E+02	
23	2.68E+05	271	0.	4365	0.		
25	0.	291	0.	4770	0.		
27	0.	311	0.	4576	0.		
TOTALS				TOTALS			
IMC	4.44E-05	1.14E-05	1.09E-05	301	2.23E-05		
4ED D	2	72	61				

AFML CIRRUS STUDY BY AFGL  
 FLIGHT 570-16 ON 4 APR 78 30 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 10112100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	PRESS (MB)
2	2.92E+09	26	3.44E+04	437	3.24E-01	9.28	29.55
3	5.61E+07	47	0.	706	5.23E-01		
5	1.35E+06	67	0.	1011	0.	T -45.69C	
7	1.38E+06	87	0.	1316	0.	FPT -43.0C	
9	1.89E+06	108	1.72E+03	1622	0.	TAS (M/S)	
11	1.89E+06	128	0.	1927	0.	125.53	
12	5.42E+05	148	0.	2233	0.	2 4.45E-04	
14	5.42E+05	169	0.	2538	0.	FORM F .29	
15	5.42E+05	189	0.	3149	0.	NT(N/M**3)	
19	2.76E+05	230	0.	3454	0.	3.5205E+01	
21	0.	250	0.	3760	0.		
23	2.76E+05	271	0.	4365	0.		
25	5.42E+05	291	0.	4770	0.		
27	2.76E+05	311	0.	4576	0.		
TOTALS				TOTALS			
IMC	6.46E-05	7.96E-06	2.75E-06	301	1.07E-05		
4ED D	9	77	56				

AFML CIRRUS STUDY BY AFGL  
 FLIGHT 570-16 ON 4 APR 78 30 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 10112100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	PRESS (MB)
2	3.11E+09	26	0.	437	9.64E-01	9.28	29.88
3	6.86E+07	47	0.	706	1.56E+00		
5	4.68E+05	67	0.	1011	0.	T -45.64C	
7	0.	87	0.	1316	0.	FPT -4.5C	
9	0.	108	1.71E+03	1622	0.	TAS (M/S)	
11	0.	128	0.	1927	0.	126.40	
12	0.	148	0.	2233	0.		
14	0.	169	0.	2538	0.	2 4.29E-04	
15	0.	189	0.	3149	0.	FORM F .10	
19	2.68E+05	230	0.	3454	0.	NT(N/M**3)	
21	0.	250	0.	3760	0.	3.5453E+01	
23	0.	271	0.	4365	0.		
25	0.	291	0.	4770	0.		
27	0.	311	0.	4576	0.		
TOTALS				TOTALS			
IMC	3.29E-05	3.56E-06	1.19E-06	301	1.17E-05		
4ED D	2	58	269				

AFML CIRRUS STUDY BY AFGL  
 FLIGHT 570-16 ON 4 APR 78 30 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 10112100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	PRESS (MB)
2	2.96E+09	26	0.	437	1.93E+00	9.29	29.43
3	5.42E+07	47	0.	706	3.11E+00		
5	1.61E+06	67	0.	1011	0.	T -45.71C	
7	1.34E+06	87	0.	1316	0.	FPT -4.5C	
9	3.88E+05	108	0.	1622	0.	TAS (M/S)	
11	3.05E+05	128	0.	1927	0.	126.14	
12	5.35E+05	148	0.	2233	0.		
14	5.35E+05	169	0.	2538	0.	2 8.54E-04	
15	0.	189	0.	3149	0.	FORM F .91	
19	0.	230	0.	3454	0.	NT(N/M**3)	
21	0.	250	0.	3760	0.	1.5961E+00	
23	0.	271	0.	4365	0.		
25	0.	291	0.	4770	0.		
27	0.	311	0.	4576	0.		
TOTALS				TOTALS			
IMC	3.69E-05	0.	1.64E-05	301	1.64E-05		
4ED D	2	0	301				

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18113100

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	PRESS (MB)	ALT (KM)
2	3.14E+09	25	0.	3.68E+01	294.80	9.28
3	6.29E+07	47	5.	706		
5	0.	67	0.	1311	T -45.64C	
7	0.	87	0.	1716	FPT -43.1C	
9	0.	108	0.	1622	TAS (M/S)	
11	0.	128	0.	1327	125.15	
12	0.	148	0.	2233	2.4, 23E-04	
14	0.	169	0.	2543	FORM F.44	
16	0.	189	0.	2843	NT(N/H**3)	
18	0.	209	0.	3143	8.5113E+00	
19	0.	230	0.	3454		
21	0.	250	0.	3760		
23	2.69E+05	271	0.	4065		
25	0.	291	0.	4371		
27	0.	311	0.	4676		
IMC	3.44E-05	0.	0.	3.14E-05	TOTALS	
4ED 0	2			191	3.14E-05	191

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18113100

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	PRESS (MB)	ALT (KM)
2	3.12E+09	26	0.	3.25E-01	294.32	9.29
3	5.99E+07	47	0.	5.24E-01		
5	1.08E+06	67	0.	1011	T -45.78C	
7	2.71E+05	87	0.	1716	FPT -42.8C	
9	5.41E+05	108	0.	1622	TAS (M/S)	
11	1.75E+06	128	0.	1927	125.15	
12	2.71E+05	148	0.	2233	2.4, 75E-04	
14	0.	169	0.	2543	FORM F.44	
16	2.71E+05	189	0.	2843	NT(N/H**3)	
18	0.	209	0.	3143	5.8918E+02	
19	0.	230	0.	3454		
21	0.	250	0.	3760		
23	5.41E+05	271	0.	4065		
25	2.71E+05	291	0.	4371		
27	2.71E+05	311	0.	4676		
IMC	5.51E-05	0.	0.	2.76E-06	TOTALS	
4ED 0	3			301	7.35E-05	61

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18114100

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	PRESS (MB)	ALT (KM)
2	3.21E+09	26	0.	4.62E+00	294.36	9.29
3	6.09E+07	47	0.	706		
5	5.41E+05	67	0.	1311	T -45.76C	
7	2.71E+05	87	0.	1716	FPT -42.7C	
9	0.	108	0.	1622	TAS (M/S)	
11	2.71E+05	128	0.	1927	125.14	
12	0.	148	0.	2233	2.6, 92E-05	
14	2.71E+05	169	0.	2543	FORM F.52	
16	5.41E+05	189	0.	2843	NT(N/H**3)	
18	0.	209	0.	3143	3.6331E+02	
19	0.	230	0.	3454		
21	0.	250	0.	3760		
23	2.71E+05	271	0.	4065		
25	0.	291	0.	4371		
27	0.	311	0.	4676		
IMC	3.62E-05	0.	0.	3.95E-06	TOTALS	
4ED 0	2			191	4.38E-05	59

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 4 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18114100

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	PRESS (MB)	ALT (KM)
2	3.21E+09	26	0.	4.62E+00	294.36	9.29
3	6.09E+07	47	0.	706		
5	5.41E+05	67	0.	1311	T -45.78C	
7	2.71E+05	87	0.	1716	FPT -42.9C	
9	0.	108	0.	1622	TAS (M/S)	
11	0.	128	0.	1927	124.80	
12	0.	148	0.	2233	0.	
14	0.	169	0.	2543	FORM F.600	
16	0.	189	0.	2843	NT(N/H**3)	
18	0.	209	0.	3143	0.	
19	0.	230	0.	3454		
21	0.	250	0.	3760		
23	0.	271	0.	4065		
25	0.	291	0.	4371		
27	0.	311	0.	4676		
IMC	3.16E-05	0.	0.	3.95E-06	TOTALS	
4ED 0	2			191	0.	0

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 76 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1815100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	3.27E+09	26 0.	437 1.00E+00	9.28	9.28
3	6.74E+07	47 0.	706 0.		
5	0.	67 0.	1011 0.	T -44.04C	T -43.96C
7	0.	87 0.	1316 0.		
9	0.	108 0.	1622 0.	FPT -43.0C	FPT -42.7C
11	0.	128 0.	1927 0.	TAS (M/S)	TAS (M/S)
12	0.	148 0.	2233 0.	124.79	125.76
14	0.	169 0.	2538 0.		
16	0.	189 0.	2843 0.	Z 1.15E-05	Z 9.07E-05
18	0.	209 0.	3149 0.		
19	0.	230 0.	3454 0.	FORM F1.00	FORM F1.00
21	0.	250 0.	3760 0.		
23	0.	271 0.	4065 0.	NT(N/M <sup>3</sup> )	NT(N/M <sup>3</sup> )
25	0.	291 0.	4370 0.	2.3236E-01	1.8254E+00
27	0.	311 0.	4676 0.		
TOTALS					
IMC	3.22E-05	0.	0.57E-07	191	191
MED D	2	0	191		

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 76 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1815130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	3.28E+09	26 0.	437 1.53E+01	9.28	9.28
3	7.16E+07	47 0.	706 0.		
5	2.72E+05	67 0.	1011 0.	T -44.05C	T -43.91C
7	0.	87 0.	1316 0.		
9	0.	108 0.	1622 0.	FPT -42.9C	FPT -42.7C
11	0.	128 0.	1927 0.	TAS (M/S)	TAS (M/S)
12	0.	148 0.	2233 0.	125.31	126.11
14	0.	169 0.	2538 0.		
16	0.	189 0.	2843 0.	Z 1.76E-04	Z 1.36E-04
18	0.	209 0.	3149 0.		
19	0.	230 0.	3454 0.	FORM F1.00	FORM F1.00
21	0.	250 0.	3760 0.		
23	0.	271 0.	4065 0.	NT(N/M <sup>3</sup> )	NT(N/M <sup>3</sup> )
25	0.	291 0.	4370 0.	3.5463E+00	2.7381E+00
27	0.	311 0.	4676 0.		
TOTALS					
IMC	3.25E-05	0.	1.31E-05	191	191
MED D	2	0	191		

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 76 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1816100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	3.23E+09	26 0.	437 7.88E+00	9.28	9.28
3	6.95E+07	47 0.	706 0.		
5	0.	67 0.	1011 0.	T -43.96C	T -43.96C
7	0.	87 0.	1316 0.		
9	0.	108 0.	1622 0.	FPT -42.7C	FPT -42.7C
11	0.	128 0.	1927 0.	TAS (M/S)	TAS (M/S)
12	0.	148 0.	2233 0.	125.76	125.76
14	0.	169 0.	2538 0.		
16	0.	189 0.	2843 0.	Z 9.07E-05	Z 9.07E-05
18	0.	209 0.	3149 0.		
19	0.	230 0.	3454 0.	FORM F1.00	FORM F1.00
21	0.	250 0.	3760 0.		
23	0.	271 0.	4065 0.	NT(N/M <sup>3</sup> )	NT(N/M <sup>3</sup> )
25	0.	291 0.	4370 0.	1.8254E+00	1.8254E+00
27	0.	311 0.	4676 0.		
TOTALS					
IMC	3.20E-05	0.	6.74E-06	191	191
MED D	2	0	191		

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 76 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1816130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	3.21E+09	26 0.	437 1.18E+01	9.27	9.27
3	6.48E+07	47 0.	706 0.		
5	2.69E+05	67 0.	1011 0.	T -43.91C	T -43.91C
7	0.	87 0.	1316 0.		
9	0.	108 0.	1622 0.	FPT -42.7C	FPT -42.7C
11	0.	128 0.	1927 0.	TAS (M/S)	TAS (M/S)
12	0.	148 0.	2233 0.	126.11	126.11
14	0.	169 0.	2538 0.		
16	0.	189 0.	2843 0.	Z 1.36E-04	Z 1.36E-04
18	0.	209 0.	3149 0.		
19	0.	230 0.	3454 0.	FORM F1.00	FORM F1.00
21	0.	250 0.	3760 0.		
23	0.	271 0.	4065 0.	NT(N/M <sup>3</sup> )	NT(N/M <sup>3</sup> )
25	0.	291 0.	4370 0.	2.7381E+00	2.7381E+00
27	0.	311 0.	4676 0.		
TOTALS					
IMC	3.16E-05	0.	1.01E-05	191	191
MED D	2	0	191		

AFGL CIRRUS STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18117100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	PRECIP PROBE
2	3.20E+09	26	0.	437	1.96E+00
3	6.29E+07	47	0.	706	0.
5	2.70E+05	67	0.	1011	0.
7	2.70E+05	87	0.	1316	0.
9	0.	108	0.	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	0.
14	0.	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				ALT (KM)	PRECIP (MB)
IWC 3.14E-05				9.28	294.49
MED 0				T -44.04C	
				FPT -42.7C	
				TAS (M/S)	
				125.78	
				Z 2.25E-05	
				FORM F 1.00	
				NT (N/M <sup>3</sup> )	
				4.5389E-01	
				TOTALS	
				1.67E-06	191
				191	

AFGL CIRRUS STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18117130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	PRECIP PROBE
2	3.21E+09	26	0.	437	3.21E-01
3	7.31E+07	47	0.	706	5.18E-01
5	5.39E+05	67	0.	1011	0.
7	2.67E+05	87	0.	1316	0.
9	0.	108	0.	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	0.
14	0.	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	1.59E+06	311	0.	4676	0.
TOTALS				ALT (KM)	PRECIP (MB)
IWC 0.07E-05				9.29	294.21
MED 0				T -44.13C	
				FPT -43.0C	
				TAS (M/S)	
				126.98	
				Z 1.42E-04	
				FORM F .91	
				NT (N/M <sup>3</sup> )	
				2.3238E-01	
				TOTALS	
				2.72E-06	301
				301	

AFGL CIRRUS STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18118100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	PRECIP PROBE
2	3.18E+09	26	0.	437	6.36E-01
3	6.45E+07	47	0.	706	1.03E+00
5	5.31E+05	67	0.	1011	0.
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	0.
11	0.	128	0.	1927	0.
12	2.64E+05	148	0.	2233	0.
14	0.	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				ALT (KM)	PRECIP (MB)
IWC 3.18E-05				9.30	293.87
MED 0				T -44.19C	
				FPT -43.1C	
				TAS (M/S)	
				126.73	
				Z 4.19E-04	
				FORM F .91	
				NT (N/M <sup>3</sup> )	
				6.8584E-01	
				TOTALS	
				6.04E-06	301
				301	

AFGL CIRRUS STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18118130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	PRECIP PROBE
2	3.21E+09	26	0.	437	9.47E-01
3	6.66E+07	47	0.	706	1.53E+00
5	0.	67	0.	1011	0.
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	0.
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	0.
14	0.	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				ALT (KM)	PRECIP (MB)
IWC 3.16E-05				9.30	293.87
MED 0				T -44.19C	
				FPT -43.1C	
				TAS (M/S)	
				126.73	
				Z 4.19E-04	
				FORM F .91	
				NT (N/M <sup>3</sup> )	
				6.8584E-01	
				TOTALS	
				6.04E-06	301
				301	

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18120100

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18120100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	
2	3.09E+09	26	0.	9.30	
3	7.12E+07	47	0.		
5	7.83E+05	67	0.	T -44.28C	
7	2.61E+05	108	0.	FPT -43.0C	
9	2.61E+05	128	0.	TAS (M/S)	
11	2.61E+05	148	0.	129.95	
12	2.61E+05	169	0.	2.1.39E-04	
14	0.	189	0.	FORM F .91	
16	0.	209	0.	NT(N/M**3)	
18	0.	230	0.	2.266E-01	
19	0.	250	0.		
21	0.	271	0.		
23	0.	291	0.		
25	0.	311	0.		
27	0.				
TOTALS					
INC	3.20E-05	0.	0.	2.66E-06	301
4ED D	2				

INC	3.20E-05	0.	0.	2.66E-06	301
4ED D	2				

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18120130

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18120130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	
2	3.07E+09	26	0.	9.30	
3	6.91E+07	47	0.		
5	2.09E+06	67	0.	T -44.23C	
7	1.56E+06	108	0.	FPT -42.9C	
9	1.04E+06	128	0.	TAS (M/S)	
11	0.	148	0.	129.96	
12	5.22E+05	169	0.	2.1.39E-05	
14	0.	189	0.	FORM F .91	
16	2.61E+05	209	0.	NT(N/M**3)	
18	0.	230	0.	2.271E-01	
19	0.	250	0.		
21	0.	271	0.		
23	0.	291	0.		
25	0.	311	0.		
27	0.				
TOTALS					
INC	3.44E-05	0.	0.	2.72E-06	191
4ED D	2				

INC	3.44E-05	0.	0.	2.72E-06	191
4ED D	2				

AFGL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 16122100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	293.37
2	3.12E+09	26	0.	437	9.31
3	6.41E+07	47	0.	706	
5	3.37E+06	67	0.	1011	T -44.36C
7	2.33E+06	87	0.	1716	
9	1.55E+06	108	1.64E+03	1622	FPT -43.1C
11	1.52E+06	128	0.	1927	
12	7.86E+05	148	0.	2233	TAS (M/S)
14	2.59E+05	169	0.	2538	130.96
15	5.18E+05	199	0.	2843	
18	0.	209	0.	3149	Z 1.28E-06
21	0.	230	0.	3454	
24	0.	250	0.	3760	FORM F1.00
25	0.	271	0.	4065	
26	0.	291	0.	4370	NT(N/M**3)
27	5.16E+05	311	0.	4676	3.3491E+01
TOTALS					
INC	4.97E-05	2	3.47E-06	0.	3.43E-06
4ED	0	2	58	0	58

AFGL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 16122130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	293.30
2	3.20E+09	26	0.	437	9.31
3	7.44E+07	47	0.	706	
5	3.10E+06	67	0.	1011	T -44.36C
7	2.58E+06	87	0.	1716	
9	5.17E+05	108	0.	1622	FPT -43.2C
11	0.	128	0.	1927	
12	2.58E+05	148	0.	2233	TAS (M/S)
14	5.16E+05	169	0.	2538	131.22
16	2.58E+05	189	0.	2843	
18	0.	209	0.	3149	Z 0.
19	0.	230	0.	3454	
21	0.	250	0.	3760	FORM F0.00
23	0.	271	0.	4065	
25	2.59E+05	291	0.	4370	NT(N/M**3)
27	0.	311	0.	4676	0.
TOTALS					
INC	4.08E-05	2	0.	8.	0.
4ED	0	2	0	0	0

AFGL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 16122100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	293.71
2	3.07E+09	26	0.	437	9.30
3	6.11E+07	47	0.	706	
5	5.98E+06	67	0.	1011	T -44.33C
7	2.34E+06	87	0.	1316	
9	2.86E+06	108	0.	1622	FPT -43.0C
11	2.80E+06	128	0.	1927	
12	5.20E+05	148	0.	2233	TAS (M/S)
14	1.30E+06	169	0.	2538	130.29
16	2.60E+05	189	0.	2843	
18	0.	209	0.	3149	Z 7.30E-06
21	0.	230	0.	3454	
24	0.	250	0.	3760	FORM F1.00
25	0.	271	0.	4065	
26	0.	291	0.	4370	NT(N/M**3)
27	0.	311	0.	4676	1.4695E-01
TOTALS					
INC	4.14E-05	2	5.42E-07	191	5.42E-07
4ED	0	2	191	191	191

AFGL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 16122130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	293.52
2	3.02E+09	26	0.	437	9.31
3	7.86E+07	47	0.	706	
5	2.08E+06	67	4.07E+03	1011	T -44.36C
7	2.59E+06	87	0.	1316	
9	2.87E+06	108	1.65E+03	1622	FPT -43.0C
11	1.30E+06	128	0.	1927	
12	0.	148	0.	2233	TAS (M/S)
14	0.	169	0.	2538	130.64
16	1.84E+06	189	0.	2843	
18	2.60E+05	209	0.	3149	Z 9.07E-06
19	2.85E+06	230	0.	3454	
21	0.	250	0.	3760	FORM F .43
23	0.	271	0.	4065	
25	2.60E+05	291	0.	4370	NT(N/M**3)
27	1.56E+06	311	0.	4676	1.1673E+02
TOTALS					
INC	9.45E-05	19	6.75E-06	54	5.42E-07
4ED	0	19	54	191	7.30E-06

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18123103

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	293.16
2	3.04E+09	26	9.81E+04	437	3.08E-01	9.31
3	9.60E+07	47	0.	706	4.98E-01	0.
5	1.41E+07	67	0.	1011	0.	0.
7	8.49E+06	87	4.81E+03	1316	0.	0.
9	4.89E+06	108	6.54E+03	1622	0.	0.
11	5.15E+06	128	8.48E+03	1927	0.	0.
12	3.09E+06	148	7.63E+03	2233	0.	0.
13	2.06E+06	169	0.	2538	0.	0.
14	1.29E+06	189	4.29E+03	2843	0.	0.
15	7.72E+05	209	2.78E+03	3149	0.	0.
19	5.14E+05	230	1.02E+03	3454	0.	0.
21	7.71E+05	250	0.	3760	0.	0.
23	2.57E+05	271	0.	4065	0.	0.
25	5.14E+05	291	0.	4370	0.	0.
27	5.14E+05	311	0.	4676	0.	0.
TOTALS						
WCD 0	1.00E-04		1.49E-04	2.62E-06	301	72
WCD 0	12		72			

TOTALS  
WCD 0 12 72 301 72

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18124100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	293.13
2	2.44E+09	26	1.04E+06	437	2.47E+02	9.31
3	1.07E+08	47	3.24E+05	706	1.04E+01	0.
5	2.51E+07	67	5.20E+04	1011	0.	0.
7	1.76E+07	87	6.67E+04	1316	0.	0.
9	1.38E+07	108	2.59E+05	1622	0.	0.
11	1.40E+07	128	1.78E+05	1927	0.	0.
12	6.38E+06	148	9.63E+04	2233	0.	0.
14	1.30E+07	169	2.96E+04	2538	0.	0.
15	3.68E+06	189	5.47E+04	2843	0.	0.
19	3.31E+06	209	1.04E+04	3149	0.	0.
21	3.31E+06	230	8.08E+03	3454	0.	0.
23	1.57E+06	250	4.49E+03	3760	0.	0.
25	3.31E+06	271	2.44E+03	4065	0.	0.
27	4.08E+06	291	1.32E+03	4370	0.	0.
TOTALS						
WCD 0	4.01E-04		2.57E-03	2.56E-04	203	69
WCD 0	20		57			

TOTALS  
WCD 0 20 57 203 69

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18123130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	293.16
2	3.01E+09	26	2.60E+05	437	2.36E+02	9.31
3	9.49E+07	47	7.69E+04	706	4.98E+00	0.
5	2.61E+07	67	0.	1011	0.	0.
7	1.42E+07	87	2.63E+04	1316	0.	0.
9	1.15E+07	108	5.52E+04	1622	0.	0.
11	6.14E+06	128	4.31E+04	1927	0.	0.
12	4.34E+06	148	4.45E+04	2233	0.	0.
14	1.02E+07	169	1.77E+04	2538	0.	0.
16	5.62E+06	189	3.20E+04	2843	0.	0.
18	2.85E+06	209	1.29E+04	3149	0.	0.
19	1.33E+06	230	4.05E+03	3454	0.	0.
21	1.28E+06	250	2.85E+03	3760	0.	0.
23	1.53E+06	271	1.98E+03	4065	0.	0.
25	1.53E+06	291	1.75E+03	4370	0.	0.
27	1.79E+06	311	1.32E+03	4676	0.	0.
TOTALS						
WCD 0	2.27E-04		1.07E-03	2.18E-04	197	93
WCD 0	16		77			

TOTALS  
WCD 0 16 77 197 93

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18124130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	292.96
2	2.95E+09	26	4.21E+05	437	3.04E+02	9.32
3	1.07E+08	47	1.45E+05	706	1.45E+00	0.
5	1.53E+07	67	2.10E+04	1011	0.	0.
7	1.09E+07	87	6.19E+04	1316	0.	0.
9	6.62E+06	108	1.44E+05	1622	0.	0.
11	8.65E+06	128	6.95E+04	1927	0.	0.
12	3.56E+06	148	3.77E+04	2233	0.	0.
14	4.58E+06	169	5.44E+03	2538	0.	0.
16	5.09E+06	189	5.04E+03	2843	0.	0.
18	2.80E+06	209	2.75E+03	3149	0.	0.
19	1.78E+06	230	0.	3454	0.	0.
21	1.02E+06	250	2.24E+03	3760	0.	0.
23	1.51E+06	271	2.61E+03	4065	0.	0.
25	2.29E+06	291	3.04E+03	4370	0.	0.
27	2.04E+06	311	2.21E+03	4676	0.	0.
TOTALS						
WCD 0	2.25E-04		1.15E-03	2.64E-04	195	68
WCD 0	19		53			

TOTALS  
WCD 0 19 53 195 68

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START# 18125100

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START# 18125100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	ALT (KM)	TOTALS
2	2.91E+09	26	6.42E+04	437	5.42E+01	2	2.98E+09	26	7.46E+05	437	4.33E+02
3	8.43E+07	47	3.38E+04	706	0.	3	1.05E+08	47	1.02E+05	706	2.97E+00
5	6.06E+06	67	7.98E+03	1011	0.	5	1.66E+07	67	2.80E+04	1011	0.
7	6.82E+06	87	1.42E+04	1316	0.	7	1.59E+07	87	1.91E+04	1316	0.
9	3.94E+06	108	3.53E+04	1622	0.	9	1.07E+07	108	1.22E+05	1622	0.
11	2.02E+06	128	1.65E+04	1927	0.	11	7.65E+06	128	4.45E+04	1927	0.
12	2.02E+06	148	7.49E+03	2333	0.	12	8.57E+06	148	4.64E+04	2333	0.
14	2.02E+06	169	0.	2538	0.	14	6.89E+06	169	2.42E+04	2538	0.
16	2.02E+06	189	4.17E+03	2843	0.	16	3.31E+06	189	3.95E+04	2843	0.
18	5.06E+05	209	5.45E+03	3149	0.	18	3.05E+06	209	2.38E+04	3149	0.
19	3.02E+05	230	3.01E+03	3454	0.	19	1.78E+06	230	1.01E+04	3454	0.
21	3.05E+05	250	0.	3760	0.	21	2.04E+06	250	3.37E+03	3760	0.
23	5.06E+05	271	4.17E+02	4065	0.	23	2.80E+06	271	4.34E+03	4065	0.
25	7.97E+05	291	8.34E+02	4770	0.	25	1.27E+06	291	5.56E+03	4770	0.
27	5.05E+05	311	1.67E+03	4676	0.	27	1.02E+06	311	3.91E+03	4676	0.
IMC	9.57E+05	15	3.76E+04	72		IMC	2.10E+04	17	1.79E+03	81	
MEQ D						MEQ D					
TOTALS				TOTALS				TOTALS			
4.63E+05				4.22E+04				3.64E+04			
191				83				193			

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START# 18126130

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START# 18125130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	ALT (KM)	TOTALS
2	3.37E+09	26	1.61E+05	437	4.21E+02	2	3.24E+09	26	4.24E+05	437	2.46E+00
3	9.24E+07	47	5.09E+04	706	6.40E+00	3	1.03E+08	47	6.01E+04	706	3.97E+00
5	8.10E+06	67	0.	1011	0.	5	1.05E+07	67	2.41E+04	1011	0.
7	8.62E+06	87	4.72E+03	1316	0.	7	7.43E+06	87	4.07E+04	1316	0.
9	6.06E+06	108	1.51E+04	1622	0.	9	5.78E+06	108	9.75E+04	1622	0.
11	4.81E+06	128	1.67E+04	1927	0.	11	5.60E+06	128	5.43E+04	1927	0.
12	2.94E+06	148	1.75E+04	2333	0.	12	1.02E+06	148	3.42E+04	2333	0.
14	3.44E+06	169	6.97E+03	2538	0.	14	4.10E+06	169	1.01E+04	2538	0.
16	1.77E+06	189	1.00E+04	2843	0.	16	2.56E+06	189	1.02E+04	2843	0.
18	1.78E+06	209	7.11E+03	3149	0.	18	1.79E+06	209	6.45E+03	3149	0.
19	2.92E+05	230	0.	3454	0.	19	1.79E+06	230	0.	3454	0.
21	2.92E+05	250	0.	3760	0.	21	2.57E+05	250	1.12E+03	3760	0.
23	7.63E+05	271	1.91E+03	4065	0.	23	2.31E+06	271	0.	4065	0.
25	5.06E+05	291	3.61E+03	4370	0.	25	1.54E+06	291	0.	4370	0.
27	1.52E+06	311	2.81E+03	4676	0.	27	1.26E+06	311	0.	4676	0.
IMC	1.30E+04	15	5.96E+04	83		IMC	1.74E+04	13	0.44E+04	64	
MEQ D						MEQ D					
TOTALS				TOTALS				TOTALS			
3.88E-04				9.78E-04				2.09E-05			
196				128				301			



AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10120100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	ALT (KM)	TOTALS
2	2.37E+09	26	9.04E+05	437	0.40E+02	9.30	293.70
3	1.20E+08	67	1.50E+05	706	5.11E+00	T -44.13C	
5	2.79E+07	87	2.07E+04	1811	0.	FPT -42.5C	
7	2.32E+07	108	4.85E+04	1316	0.	TAS (M/S)	
9	1.58E+07	128	8.18E+04	1622	0.	128.79	
11	1.16E+07	148	1.07E+05	2233	0.	2.78E-02	
12	8.17E+06	169	3.46E+04	2578	0.	FORM F.52	
14	1.03E+07	189	7.83E+04	3149	0.	NTIN (M/S)	
16	7.90E+06	209	6.27E+04	3454	0.	1.70E+04	
18	4.75E+06	230	4.59E+04	3760	0.	TOTALS	
19	3.69E+06	250	2.80E+04	4705	0.	4.74E-03	
21	4.74E+06	271	1.66E+04	4770	0.	193	
23	4.74E+06	291	1.35E+04	4676	0.	7.24E-04	
25	4.74E+06	311	8.58E+03			4.02E-03	
27	3.16E+06					89	
INC	4.21E-04					21	
MEAN							

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10127100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	ALT (KM)	TOTALS
2	2.68E+09	26	7.87E+05	437	1.05E+02	9.29	294.42
3	1.10E+08	67	1.39E+05	706	1.00E+00	T -44.10C	
5	1.89E+07	87	1.22E+04	1011	0.	FPT -43.2C	
7	1.66E+07	108	4.83E+04	1316	0.	TAS (M/S)	
9	1.01E+07	128	8.09E+04	1622	0.	130.99	
11	6.45E+06	148	6.07E+04	2233	0.	2.75E-03	
12	4.65E+06	169	2.77E+04	2578	0.	FORM F.60	
14	4.14E+06	189	1.75E+04	3149	0.	NTIN (M/S)	
16	2.34E+06	209	1.40E+04	3454	0.	1.1914E+04	
18	1.55E+06	230	3.07E+03	3760	0.	TOTALS	
19	2.84E+06	250	1.17E+03	4705	0.	1.79E-03	
21	1.55E+06	271	1.02E+03	4770	0.	70	
23	3.62E+06	291	9.14E+02	4676	0.	194	
25	1.55E+06	311	6.77E+02			8.49E-05	
27						1.70E-03	
INC	2.53E-04					20	
MEAN							

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10120130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	ALT (KM)	TOTALS
2	3.11E+09	26	5.67E+05	437	1.62E+02	9.31	293.51
3	1.00E+08	67	7.91E+04	706	2.03E+00	T -44.25C	
5	1.26E+07	87	1.24E+04	1011	0.	FPT -42.8C	
7	8.40E+06	108	2.94E+04	1716	0.	TAS (M/S)	
9	7.09E+06	128	8.04E+04	1622	0.	129.12	
11	5.77E+06	148	5.61E+04	1927	0.	2.36E-03	
12	3.41E+06	169	7.00E+04	2233	0.	FORM F.52	
14	3.51E+06	189	1.76E+04	2538	0.	NTIN (M/S)	
16	4.99E+06	199	3.20E+04	2843	0.	8.47E+03	
18	2.63E+06	209	1.42E+04	3454	0.	TOTALS	
19	2.10E+06	230	4.15E+03	3760	0.	1.37E-03	
21	7.87E+05	250	2.31E+03	4065	0.	72	
23	1.57E+06	271	1.81E+03	4676	0.	1.37E-04	
25	2.36E+06	291	1.42E+03			1.95	
27	1.64E+06	311	1.05E+03			19	
INC	2.28E-04						
MEAN							

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10127130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	ALT (KM)	TOTALS
2	3.07E+09	26	5.67E+05	437	3.06E+02	9.29	294.34
3	1.04E+08	67	9.69E+04	706	4.09E+00	T -44.05C	
5	1.26E+07	87	1.24E+04	1011	0.	FPT -42.6C	
7	8.40E+06	108	1.97E+04	1716	0.	TAS (M/S)	
9	5.82E+06	128	1.20E+05	1622	0.	128.88	
11	3.36E+06	148	6.43E+04	1927	0.	2.65E-03	
12	1.84E+06	169	4.58E+04	2233	0.	FORM F.46	
14	3.94E+06	189	2.17E+04	2538	0.	NTIN (M/S)	
16	3.82E+06	199	2.79E+04	2843	0.	9.42E+03	
18	2.82E+06	209	2.79E+04	3149	0.	TOTALS	
19	1.06E+06	230	9.42E+03	3454	0.	2.70E-04	
21	2.14E+06	250	4.63E+03	3760	0.	1.95	
23	1.57E+06	271	3.64E+03	4065	0.	83	
25	1.04E+06	291	2.85E+03	4370	0.	1.91E-03	
27	3.13E+06	311	2.03E+03	4676	0.	77	
INC	2.23E-04						
MEAN							

AFML CIRRHUS STUDY BY AFGL  
FLIGHT# E70-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 10129100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	TOTALS
2	2.90E+09	26	4.34E+05	1.23E+02	1.69E-03
3	1.11E+00	47	1.05E+05	5.09E-01	9.31
5	1.55E+07	67	1.24E+04	1011	0.
7	7.35E+06	87	1.23E+04	1316	0.
9	9.44E+06	108	6.97E+04	1622	0.
11	7.08E+06	128	5.93E+04	1927	0.
12	4.72E+06	148	6.07E+04	2233	0.
14	4.98E+06	169	2.48E+04	2538	0.
16	3.41E+06	189	4.15E+04	2843	0.
18	3.41E+06	209	2.08E+04	3149	0.
19	2.62E+06	230	9.35E+03	3454	0.
21	7.08E+05	250	6.92E+03	3760	0.
23	1.57E+06	271	3.07E+03	4065	0.
25	2.34E+06	291	1.36E+03	4370	0.
27	1.53E+06	311	9.75E+02	4676	0.
INC	2.45E-04	1.59E-03	9.19E-05	9.31	61
4ED 0	10	79	193	193	193

AFML CIRRHUS STUDY BY AFGL  
FLIGHT# E70-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 10129130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	TOTALS
2	3.17E+09	26	2.35E+05	1.78E+02	1.69E-03
3	8.94E+07	47	5.29E+04	1.53E+00	9.31
5	6.85E+06	67	7.39E+03	1011	0.
7	4.22E+06	87	2.16E+04	1316	0.
9	3.83E+06	108	2.16E+04	1622	0.
11	2.37E+06	128	2.16E+04	1927	0.
12	1.32E+06	148	1.86E+04	2233	0.
14	2.37E+06	169	6.44E+03	2538	0.
16	1.58E+06	189	1.83E+04	2843	0.
18	7.98E+05	209	9.49E+03	3149	0.
19	7.98E+05	230	5.22E+03	3454	0.
21	2.65E+05	250	2.32E+03	3760	0.
23	7.91E+05	271	2.05E+03	4065	0.
25	7.90E+05	291	1.60E+03	4370	0.
27	1.05E+06	311	1.31E+03	4676	0.
INC	1.10E-04	6.20E-04	1.40E-04	9.31	91
4ED 0	16	84	154	154	154

AFML CIRRHUS STUDY BY AFGL  
FLIGHT# E70-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 10130100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	TOTALS
2	3.29E+09	26	0.	4.37	2.10E+01
3	8.79E+07	47	8.80E+03	706	0.
5	3.69E+06	67	4.13E+03	1811	0.
7	1.84E+06	87	0.	1316	0.
9	1.32E+06	108	1.17E+04	1622	0.
11	2.65E+05	128	1.24E+03	1927	0.
12	7.08E+05	148	2.92E+03	2233	0.
14	7.08E+05	169	0.	2538	0.
16	2.65E+05	189	0.	2843	0.
18	5.20E+05	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	2.66E+05	250	0.	3760	0.
23	2.64E+05	271	4.96E+02	4065	0.
25	0.	291	9.91E+02	4370	0.
27	0.	311	1.98E+03	4676	0.
INC	5.00E-05	1.31E-04	1.86E-05	9.31	131
4ED 0	2	127	191	191	191

AFML CIRRHUS STUDY BY AFGL  
FLIGHT# E70-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 10130130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	TOTALS
2	3.26E+09	26	3.41E+04	437	0.
3	9.61E+07	47	8.39E+03	706	0.
5	1.67E+06	67	2.54E+03	1811	0.
7	1.08E+06	87	1.21E+04	1316	0.
9	5.87E+05	108	1.21E+04	1622	0.
11	2.73E+05	128	1.28E+03	1927	0.
12	0.	148	1.01E+03	2233	0.
14	2.70E+05	169	6.81E+02	2538	0.
16	5.38E+05	189	0.	2843	0.
18	2.72E+05	209	0.	3149	0.
19	2.72E+05	230	0.	3454	0.
21	2.68E+05	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	2.60E+05	311	0.	4676	0.
INC	4.91E-05	5.00E-05	0.	9.31	50
4ED 0	2	58	0	0	50

AFML CIRRUS STUDY BY AFGL  
FLIGHT 78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18132100

AFML CIRRUS STUDY BY AFGL  
FLIGHT 78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18131100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE
2	3.28E+09	26	0.	2	3.28E+09	26	0.
3	9.19E+07	47	0.	3	8.79E+07	47	0.
5	1.37E+06	67	0.	5	0.	67	0.
7	1.64E+06	87	0.	7	0.	87	0.
9	1.37E+06	108	0.	9	0.	108	0.
11	1.37E+06	128	0.	11	0.	128	0.
12	5.48E+05	148	0.	12	0.	148	0.
14	9.47E+05	169	0.	14	0.	169	0.
16	1.16E+06	189	0.	16	0.	189	0.
18	0.	209	0.	18	0.	209	0.
19	8.22E+05	230	0.	19	0.	230	0.
21	2.73E+05	250	0.	21	0.	250	0.
23	0.	271	0.	23	0.	271	0.
25	2.74E+05	291	0.	25	0.	291	0.
27	0.	311	0.	27	0.	311	0.
TOTALS				TOTALS			
INC	5.64E-05		4.58E-05	INC	3.29E-05		0.
YED	0.		54	YED	0.		0.
PRESS (MB)				PRESS (MB)			
ALT (KM)				ALT (KM)			
T -45.56C				T -45.56C			
FPT -43.2C				FPT -43.2C			
TAS (M/S)				TAS (M/S)			
123.97				123.97			
Z 2.09E-05				Z 2.09E-05			
FORM F .83				FORM F .83			
MT(N/M <sup>3</sup> )				MT(N/M <sup>3</sup> )			
5.2985E+02				5.2985E+02			

AFML CIRRUS STUDY BY AFGL  
FLIGHT 78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18132133

AFML CIRRUS STUDY BY AFGL  
FLIGHT 78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18131130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE
2	3.28E+09	26	0.	2	2.99E+09	26	0.
3	8.97E+07	47	0.	3	9.09E+07	47	0.
5	0.	67	0.	5	8.03E+05	67	0.
7	0.	87	0.	7	0.	87	0.
9	0.	108	0.	9	0.	108	0.
11	0.	128	0.	11	0.	128	0.
12	0.	148	0.	12	0.	148	0.
14	0.	169	0.	14	0.	169	0.
16	0.	189	0.	16	0.	189	0.
18	0.	209	0.	18	0.	209	0.
19	0.	230	0.	19	0.	230	0.
21	0.	250	0.	21	0.	250	0.
23	0.	271	0.	23	0.	271	0.
25	0.	291	0.	25	0.	291	0.
27	0.	311	0.	27	0.	311	0.
TOTALS				TOTALS			
INC	3.28E-05		0.	INC	3.20E-05		0.
YED	0.		0.	YED	0.		0.
PRESS (MB)				PRESS (MB)			
ALT (KM)				ALT (KM)			
T -45.26C				T -45.26C			
FPT -43.5C				FPT -43.5C			
TAS (M/S)				TAS (M/S)			
124.76				124.76			
Z 0.				Z 0.			
FORM F 0.80				FORM F 0.80			
MT(N/M <sup>3</sup> )				MT(N/M <sup>3</sup> )			
0.				0.			

AFGL CIRQUE STUDY BY AFGL  
FLIGHT# 878-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1033100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/MS-3MM)				PRESS (MM)			
SIZE (MM)	SCATTER	SIZE (MM)	PRECIP PROBE	SIZE (MM)	SCATTER	SIZE (MM)	PRECIP PROBE
2	3.18E+09	26	0.	2	3.18E+09	26	0.
3	8.29E+07	47	0.	3	9.23E+07	47	0.
5	5.33E+05	67	0.	5	2.69E+05	67	0.
7	5.33E+05	67	0.	7	2.67E+05	67	0.
9	2.69E+05	108	0.	9	2.50E+03	108	0.
11	0.	128	0.	11	3.35E+05	128	0.
12	9.90E+02	148	0.	12	1.26E+03	148	0.
14	0.	169	0.	14	2.67E+05	169	0.
16	4.78E+02	189	0.	16	0.	189	0.
18	0.	209	0.	18	2.68E+05	209	0.
19	3.14E+03	230	0.	19	1.93E+03	230	0.
21	1.09E+03	250	0.	21	0.	250	0.
23	0.	271	0.	23	0.	271	0.
25	0.	291	0.	25	0.	291	0.
27	0.	311	0.	27	0.	311	0.
TOTALS				TOTALS			
INC	3.21E+05	2	0.	INC	3.61E+05	2	0.
LED	0	82	0	LED	0	69	0.
TOTALS				TOTALS			
5.33E+05				5.33E+05			
69				69			

68

AFWL CIRRUS STUDY BY AFGL  
FLIGHT# E7A-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START: 160341Z88

AFWL CIRCUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START. 101333Z

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MM)			
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	ALT (KM)
2	3.04E+09	26	3.39E+04	437	0.48E-01	2	3.03E+09
3	9.94E+07	47	0.	706	0.	3	1.05E+08
5	0.	67	0.	18.1	0.	5	2.04E+05
7	5.33E+05	87	4.98E+03	1316	0.	7	3.85E+05
9	0.	108	1.65E+03	1822	0.	11	2.67E+05
11	0.	128	3.74E+03	1927	0.	12	0.
12	0.	148	9.87E+02	2333	0.	14	0.
14	0.	168	1.65E+03	2338	0.	16	0.
16	0.	189	0.	2143	0.	18	0.
18	2.68E+05	209	0.	3149	0.	20	0.
19	0.	230	0.	3554	0.	21	0.
21	0.	250	0.	3769	0.	23	0.
23	0.	271	0.	4085	0.	25	0.
25	0.	291	0.	4378	0.	27	0.
27	0.	311	0.	4676	0.	29	0.
TOTALS				TOTALS			
INC	1.34E+08	2	3.08E+05	5.34E+07	191	INC	3.27E+05
MED D	64	64	54	191	129	MED D	129

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18136100

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18135100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	ALT (KM)	
2	2.95E+09	26	1.65E+05	437	5.84E+01	9.48	
3	9.40E+07	47	4.34E+04	706	5.08E-01		
5	3.11E+06	67	4.08E+03	1011	0.	T -45.69C	
7	3.11E+06	87	1.21E+04	1316	0.	FPT -44.4C	
9	2.33E+06	108	2.64E+04	1622	0.		
11	2.33E+06	128	2.45E+04	1927	0.		
12	1.59E+06	148	1.06E+04	2233	0.	TAS (M/S)	
14	2.07E+06	169	3.17E+04	2538	0.		
16	1.04E+06	189	1.11E+04	2843	0.	130.50	
18	7.78E+05	209	3.74E+03	3149	0.	Z 1.08E-03	
19	1.04E+07	230	2.08E+03	3454	0.	FORM F .47	
21	1.04E+06	250	0.	3760	0.		
23	1.04E+06	271	2.14E+02	4065	0.	NT(N/M**3)	
25	3.12E+06	291	4.29E+02	4370	0.	2.9060E+03	
27	7.80E+05	311	3.25E+02	4676	0.		
INC	2.15E-04		3.90E-04		4.47E-05	TOTALS	
MEQ 0	20		70		194	4.35E-04	

INC	2.15E-04		3.90E-04		4.47E-05	TOTALS	
MEQ 0	20		70		194	4.35E-04	

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18136133

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18135130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	ALT (KM)	
2	3.07E+09	26	9.03E+04	437	1.70E+01	9.47	
3	9.01E+07	47	0.	706	0.		
5	2.32E+06	67	1.21E+04	1011	0.	T -45.72C	
7	2.58E+06	87	9.69E+03	1316	0.	FPT -44.2C	
9	1.03E+06	108	1.80E+04	1622	0.		
11	5.16E+05	128	1.09E+04	1927	0.	TAS (M/S)	
12	1.03E+06	148	4.78E+03	2233	0.		
14	2.58E+05	169	3.94E+03	2538	0.	131.66	
16	0.	189	6.80E+03	2843	0.	Z 7.66E-04	
18	5.15E+05	209	5.56E+03	3149	0.	FORM F .64	
19	2.52E+07	230	3.86E+03	3454	0.		
21	5.15E+05	250	2.26E+03	3760	0.	NT(N/M**3)	
23	0.	271	1.44E+03	4065	0.	1.6341E+03	
25	0.	291	9.11E+02	4370	0.		
27	2.58E+05	311	5.78E+02	4676	0.		
INC	5.17E-05		3.61E-04		1.45E-05	TOTALS	
MEQ 0	2		86		191	3.76E-04	

INC	5.17E-05		3.61E-04		1.45E-05	TOTALS	
MEQ 0	2		86		191	3.76E-04	

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18137100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	28.74	26.11
2	3.17E+09	26 3.34E+04	437 1.92E+01	9.51		
3	1.12E+08	47 8.90E+03	706 0.			
5	1.31E+06	67 0.	1311 0.	8 -45.96C		
7	1.32E+06	87 0.	1316 0.	FPT -43.7C		
9	1.05E+06	108 1.64E+03	1622 0.	TAS 120.83		
11	7.80E+05	128 6.18E+03	1927 0.			
12	5.33E+05	148 3.91E+03	2233 0.			
14	5.33E+05	169 1.60E+03	2538 0.			
16	0.	189 3.47E+03	2843 0.			
18	0.	209 0.	3149 0.	2 6.07E-04		
19	0.	230 1.05E+03	3454 0.	FORM F .56		
21	5.22E+05	250 0.	3760 0.	NT(N/M**3)		
23	2.65E+05	271 5.12E+02	4065 0.	6.2106E+02		
25	0.	291 1.02E+03	4370 0.	TOTALS		
27	0.	311 2.09E+03	4676 0.	1.74E-04	1.64E-05	1.90E-04
IMC	4.71E-05	1.74E-04	1.64E-05	114	191	122
YED 0	2	114	191			

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18138100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	28.74	26.11
2	3.25E+09	26 1.32E+05	437 7.45E+01	9.52		
3	1.06E+08	47 1.73E+04	706 2.00E+00			
5	1.55E+06	67 0.	1311 0.	T -46.15C		
7	1.55E+06	87 0.	1316 0.	FPT -43.4C		
9	7.76E+05	108 6.59E+03	1622 0.	TAS (M/S)		
11	2.60E+05	128 3.65E+03	1927 0.			
12	5.18E+05	148 2.88E+03	2233 0.			
14	1.04E+06	169 1.58E+03	2538 0.			
16	2.59E+05	189 7.71E+03	2843 0.			
18	2.58E+05	209 7.47E+03	3149 0.	2 1.79E-03		
19	0.	230 3.09E+03	3454 0.	FORM F .47		
21	0.39E+05	250 2.87E+03	3760 0.	NT(N/M**3)		
23	0.39E+05	271 9.88E+02	4065 0.	1.1225E+03		
25	0.	291 4.28E+02	4370 0.	TOTALS		
27	0.	311 3.36E+02	4676 0.	2.61E-04	6.66E-05	3.50E-04
IMC	5.26E-05	2.61E-04	6.66E-05	90	199	95
YED 0	2	90	199			

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18137130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	28.17	28.84
2	3.21E+09	26 6.63E+04	437 5.10E+00	9.52		
3	1.05E+08	47 8.71E+03	706 0.			
5	1.31E+06	67 0.	1311 0.	1 -46.16C		
7	1.31E+06	87 0.	1316 0.	FPT -43.3C		
9	1.31E+06	108 8.30E+03	1622 0.	TAS (M/S)		
11	1.83E+06	128 4.90E+03	1927 0.			
12	2.60E+05	148 6.76E+03	2233 0.			
14	0.	169 7.75E+03	2538 0.	2 6.22E-04		
16	0.	189 7.75E+03	2843 0.	FORM F .73		
18	2.61E+05	209 3.77E+03	3149 0.	NT(N/M**3)		
19	1.05E+06	230 5.17E+03	3454 0.	1.1830E+03		
21	2.60E+05	250 1.41E+03	3760 0.	TOTALS		
23	5.25E+05	271 1.03E+03	4065 0.	3.11E-04	4.36E-06	1.15E-04
25	2.60E+05	291 9.34E+02	4370 0.	90	191	91
27	0.	311 8.39E+02	4676 0.			
IMC	6.06E-05	3.11E-04	4.36E-06	191		
YED 0	3	90	191			

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18138130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	28.84	28.84
2	3.17E+09	26 9.85E+04	437 1.15E+02	9.53		
3	1.07E+08	47 8.64E+03	706 1.00E+00			
5	2.57E+06	67 8.	1311 0.	T -46.16C		
7	1.20E+06	87 0.	1316 0.	FPT -43.6C		
9	0.	108 1.47E+04	1622 0.	TAS (M/S)		
11	5.15E+05	128 4.85E+03	1927 0.			
12	0.	148 4.77E+03	2233 0.			
14	0.	169 7.90E+02	2538 0.			
16	2.58E+05	189 1.70E+03	2843 0.	2 1.78E-03		
18	2.57E+05	209 2.79E+03	3149 0.	FORM F .42		
19	0.	230 1.01E+03	3454 0.	NT(N/M**3)		
21	2.58E+05	250 0.	3760 0.	8.7162E+02		
23	0.	271 5.26E+02	4065 0.	TOTALS		
25	2.57E+05	291 1.05E+03	4370 0.	9.25E-05	2.75E-04	122
27	0.	311 7.74E+02	4676 0.	1.82E-04	194	
IMC	4.39E-05	1.82E-04	9.25E-05	85		
YED 0	2	85	194			

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18140100

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18139100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	ALT (KM)
2	3.18E+09	26	0.	5.74E+01	9.53	2.65E+01	9.54
3	1.02E+08	47	0.50E+03	4.91E-01	0.	0.	0.
5	2.24E+06	67	0.	0.	T -46.24C	0.	T -46.15C
7	1.27E+06	87	2.37E+03	0.	0.	0.	0.
9	0.	108	4.84E+03	1622	FPT -44.1C	0.	FPT -44.7C
11	1.02E+06	128	4.78E+03	1927	TAS (M/S)	0.	TAS (M/S)
12	2.53E+05	148	9.43E+02	2233	133.54	0.	133.74
14	7.61E+05	169	7.74E+02	2538	0.	0.	0.
16	2.54E+05	189	8.37E+02	2843	0.	0.	0.
18	5.87E+05	209	0.	3149	Z 8.25E-04	0.	Z 1.69E-03
19	2.53E+05	230	1.00E+03	3454	0.	0.	0.
21	0.	250	0.	3760	FORM F .35	0.	FORM F .68
23	0.	271	2.09E+02	4065	0.	0.	0.
25	2.58E+05	291	4.18E+02	4370	NT(N/M <sup>3</sup> )	0.	NT(N/M <sup>3</sup> )
27	0.	311	3.18E+02	4676	5.2018E+02	0.	1.0604E+03
IMC	4.77E-05	2	7.63E-05	4.38E-05	TOTALS	2.27E-05	TOTALS
WFO	0.	0	0	194	1.20E-04	117	4.74E-04
WFO	0.	0	0	124	0.	0.	118

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18140130

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18139130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	ALT (KM)
2	3.17E+09	26	3.22E+04	2.21E+02	9.53	2.65E+01	9.54
3	1.03E+08	47	2.54E+04	4.91E-01	0.	0.	0.
5	1.52E+06	67	0.	0.	T -46.16C	0.	T -46.16C
7	1.27E+06	87	0.	0.	0.	0.	0.
9	5.07E+05	108	1.61E+03	1622	FPT -44.4C	0.	FPT -44.9C
11	1.27E+06	128	0.	1927	0.	0.	0.
12	5.07E+05	148	0.	2233	TAS (M/S)	0.	TAS (M/S)
14	2.54E+05	169	0.	2538	133.80	0.	133.82
16	5.07E+05	189	8.36E+02	2843	0.	0.	0.
18	2.54E+05	209	2.73E+03	3149	Z 3.32E-03	0.	Z 3.72E-05
19	2.54E+05	230	1.00E+03	3454	0.	0.	0.
21	5.06E+05	250	4.46E+03	3760	FORM F .52	0.	FORM F .66
23	0.	271	3.87E+03	4065	0.	0.	0.
25	0.	291	3.36E+03	4370	NT(N/M <sup>3</sup> )	0.	NT(N/M <sup>3</sup> )
27	2.53E+05	311	2.30E+03	4676	9.7063E+02	0.	2.7518E+02
IMC	5.39E-05	2	3.24E-04	1.02E-04	TOTALS	3.49E-05	TOTALS
WFO	0.	0	119	192	4.86E-04	0.	3.49E-05
WFO	0.	0	0	129	0.	0.	83

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1004200

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1004200

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	PRECIP PROBE
2	3.12E+09	26	0.	7.36E+00	9.54	0.	0.
3	1.25E+08	47	0.42E+07	706	0.	0.	0.
5	2.77E+06	67	0.	1011	0.	0.	0.
7	5.03E+05	87	2.35E+03	1116	0.	0.	0.
9	0.	108	6.41E+03	1622	0.	0.	0.
11	2.52E+05	128	0.30E+03	2233	0.	0.	0.
12	5.04E+05	148	1.03E+04	2538	0.	0.	0.
14	2.51E+05	169	7.69E+03	2843	0.	0.	0.
16	1.01E+06	189	7.48E+03	3149	0.	0.	0.
18	2.51E+05	209	4.53E+03	3454	0.	0.	0.
19	2.51E+05	230	3.98E+03	3760	0.	0.	0.
21	5.02E+05	250	1.11E+03	4065	0.	0.	0.
23	0.	271	0.	4370	0.	0.	0.
25	5.03E+05	291	0.	4676	0.	0.	0.
27	0.	311	0.	4976	0.	0.	0.
TOTALS							
INC	5.62E-05	2.69E-04	6.29E-06	1.91	0.	0.	0.
MEAN	0.	0.	0.	0.	0.	0.	0.

72

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1004200

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1004200

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	PRECIP PROBE
2	3.10E+09	26	0.	1.82E+00	9.54	0.	0.
3	1.11E+08	47	0.	706	0.	0.	0.
5	9.97E+05	67	0.	1011	0.	0.	0.
7	2.49E+05	87	2.32E+03	1116	0.	0.	0.
9	2.48E+05	108	0.	1622	0.	0.	0.
11	0.	128	1.17E+03	2233	0.	0.	0.
12	0.	148	1.01E+03	2538	0.	0.	0.
14	0.	169	2.29E+03	2843	0.	0.	0.
16	0.	189	5.78E+03	3149	0.	0.	0.
18	0.	209	2.69E+03	3454	0.	0.	0.
19	0.	230	0.	3760	0.	0.	0.
21	2.49E+05	250	0.	4065	0.	0.	0.
23	0.	271	2.34E+02	4370	0.	0.	0.
25	0.	291	4.69E+02	4676	0.	0.	0.
27	0.	311	9.30E+02	4976	0.	0.	0.
TOTALS							
INC	3.66E-05	1.25E-04	1.56E-04	1.91	0.	0.	0.
MEAN	0.	0.	0.	0.	0.	0.	0.



AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18143100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MM)	ALT (KM)	202.57
2	3.07E+09	26 0.	477 0.	437 0.	9.55	
3	1.19E+08	47 0.	706 0.	706 0.	-46.41C	
5	0.	67 0.	1011 0.	1011 0.		
7	0.	87 0.	1316 0.	1316 0.		
9	0.	108 0.	1622 0.	1622 0.	FPT -43.4C	
11	0.	128 0.	1927 0.	1927 0.		
12	0.	148 0.	2233 0.	2233 0.	TAS (M/S)	
14	0.	167 0.	2538 0.	2538 0.	137.48	
16	0.	189 0.	2843 0.	2843 0.		
18	0.	209 0.	3149 0.	3149 0.	Z 0.	
19	0.	230 0.	3454 0.	3454 0.	FORM F0.00	
20	0.	250 0.	3760 0.	3760 0.		
21	0.	271 0.	4065 0.	4065 0.	NT(N/M**3)	
23	0.	291 0.	4370 0.	4370 0.		
25	0.	311 0.	4676 0.	4676 0.		
27	0.					
INC	3.33E-05	0.	0.	0.	TOTALS	
4ED 0	2					

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18844100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MM)	ALT (KM)	202.57
2	3.09E+09	26 6.15E+04	437 1.31E+02	437 1.31E+02	9.55	
3	1.19E+08	47 8.07E+03	706 1.22E+01	706 1.22E+01	T -46.05C	
5	1.21E+06	67 0.	1011 0.	1011 0.		
7	6.83E+05	87 0.	1316 0.	1316 0.		
9	0.	108 6.15E+03	1622 0.	1622 0.	FPT -44.2C	
11	0.	128 0.	1927 0.	1927 0.		
12	2.41E+05	148 5.39E+03	2233 0.	2233 0.	TAS (M/S)	
14	0.	167 1.48E+03	2538 0.	2538 0.	140.04	
16	0.	189 3.99E+03	2843 0.	2843 0.		
18	0.	209 6.97E+03	3149 0.	3149 0.	Z 5.09E-03	
19	0.	230 1.91E+03	3454 0.	3454 0.	FORM F +36	
20	0.	250 1.06E+03	3760 0.	3760 0.		
21	0.	271 6.97E+02	4065 0.	4065 0.	NT(N/M**3)	
23	0.	291 4.56E+02	4370 0.	4370 0.		
25	2.42E+05	311 3.84E+02	4676 0.	4676 0.	7.7757E+02	
27	0.					
INC	3.76E-05	2.05E-04	1.68E-04	1.68E-04	TOTALS	
4ED 0	2	91	210	210		

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18143130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MM)	ALT (KM)	202.52
2	2.99E+09	26 3.08E+04	437 8.72E-01	437 8.72E-01	9.56	
3	1.13E+08	47 7.60E+03	706 1.41E+00	706 1.41E+00		
5	2.42E+05	67 2.26E+03	1011 0.	1011 0.	T -46.09C	
7	7.28E+05	87 3.09E+03	1316 0.	1316 0.		
9	7.27E+05	108 0.	1622 0.	1622 0.	FPT -43.7C	
11	4.84E+05	128 0.	1927 0.	1927 0.		
12	4.84E+05	148 0.	2233 0.	2233 0.	TAS (M/S)	
14	4.84E+05	169 0.	2538 0.	2538 0.	139.45	
16	0.	189 8.02E+02	2843 0.	2843 0.		
18	2.42E+05	209 0.	3149 0.	3149 0.	Z 3.96E-04	
19	2.42E+05	230 0.	3454 0.	3454 0.	FORM F +10	
21	2.42E+05	250 0.	3760 0.	3760 0.		
23	0.	271 0.	4065 0.	4065 0.	NT(N/M**3)	
25	2.42E+05	291 0.	4370 0.	4370 0.		
27	0.	311 0.	4676 0.	4676 0.	2.8054E+02	
INC	4.52E-05	2.46E-05	7.40E-06	7.40E-06	TOTALS	
4ED 0	2	52	301	301		

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18144130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MM)	ALT (KM)	202.54
2	3.01E+09	26 0.	437 5.11E+02	437 5.11E+02	9.56	
3	1.11E+08	47 2.44E+04	706 4.67E+01	706 4.67E+01		
5	1.22E+06	67 3.83E+03	1011 9.90E-01	1011 9.90E-01	T -46.39C	
7	1.46E+06	87 0.	1316 1.04E+00	1316 1.04E+00		
9	4.07E+05	108 0.	1622 5.51E-01	1622 5.51E-01	FPT -44.8C	
11	9.75E+05	128 0.	1927 0.	1927 0.		
12	2.44E+05	148 9.02E+02	2233 0.	2233 0.	TAS (M/S)	
14	7.32E+05	169 0.	2538 0.	2538 0.	139.11	
16	7.32E+05	189 3.22E+03	2843 0.	2843 0.		
18	4.86E+05	209 1.75E+03	3149 0.	3149 0.	Z 5.46E-02	
19	0.	230 1.93E+03	3454 0.	3454 0.	FORM F +24	
21	0.	250 1.07E+03	3760 0.	3760 0.		
23	2.44E+05	271 1.41E+03	4065 0.	4065 0.	NT(N/M**3)	
25	4.07E+05	291 1.86E+03	4370 0.	4370 0.		
27	2.44E+05	311 1.55E+03	4676 0.	4676 0.	9.0741E+02	
INC	5.78E-05	1.96E-04	7.33E-04	7.33E-04	TOTALS	
4ED 0	3	117	226	226		

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78  
TYPE1 BULL-ROSE

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78  
TYPE1 BULL-ROSE

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78  
TYPE1 BULL-ROSE

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78  
TYPE1 BULL-ROSE

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE
2	2.08E+09	26	3.11E+04	437	7.82E+02	2	2.41E+09	26	2.51E+05	437	2.13E+03	2	2.41E+09	26	2.51E+05
3	1.08E+08	47	8.20E+03	706	8.88E+01	3	1.29E+08	47	6.60E+04	706	5.24E+02	3	1.29E+08	47	6.60E+04
5	4.98E+06	67	0.	1011	3.99E+00	5	1.13E+07	67	7.74E+01	1011	5.17E+01	5	1.13E+07	67	7.74E+01
7	2.45E+06	87	0.	1316	2.62E+00	7	8.80E+06	87	1.15E+04	1316	4.28E+01	7	8.80E+06	87	1.15E+04
9	2.21E+06	108	0.	1622	1.11E+00	9	4.44E+06	108	4.55E+04	1622	2.06E+01	9	4.44E+06	108	4.55E+04
11	1.72E+06	128	0.	1927	0.	11	2.22E+06	128	2.79E+04	1927	4.13E+00	11	2.22E+06	128	2.79E+04
12	4.98E+05	148	2.72E+03	2233	0.	12	1.97E+06	148	7.54E+04	2233	1.25E+00	12	1.97E+06	148	7.54E+04
14	2.45E+05	169	7.50E+02	2538	0.	14	3.70E+06	169	7.54E+04	2538	1.34E+00	14	3.70E+06	169	7.54E+04
16	9.81E+05	189	4.85E+03	2843	0.	16	2.71E+06	189	7.26E+03	2843	0.	16	2.71E+06	189	7.26E+03
18	2.45E+05	209	5.83E+03	3149	0.	18	2.47E+06	209	8.89E+02	3149	0.	18	2.47E+06	209	8.89E+02
19	2.45E+05	230	5.83E+03	3454	0.	19	7.41E+05	230	0.	3454	0.	19	7.41E+05	230	0.
21	0.	250	1.08E+03	3760	0.	21	9.87E+05	250	1.09E+03	3760	0.	21	9.87E+05	250	1.09E+03
23	4.98E+05	271	1.66E+03	4065	0.	23	1.23E+06	271	2.23E+03	4065	0.	23	1.23E+06	271	2.23E+03
25	2.45E+05	291	2.54E+03	4370	0.	25	1.97E+06	291	4.55E+03	4370	0.	25	1.97E+06	291	4.55E+03
27	7.37E+05	311	2.16E+03	4676	0.	27	1.48E+06	311	4.10E+03	4676	0.	27	1.48E+06	311	4.10E+03
TOTALS				TOTALS				TOTALS				TOTALS			
IMC	6.84E-05	3.13E-04	1.29E-03	1.60E-03	IMC	1.66E-04	6.14E-04	8.39E-03	9.08E-03	IMC	1.66E-04	6.14E-04	8.39E-03	9.08E-03	9.08E-03
WED D	10	107	236	215	WED D	20	74	370	354	WED D	20	74	370	354	354

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78  
TYPE1 BULL-ROSE

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78  
TYPE1 BULL-ROSE

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78  
TYPE1 BULL-ROSE

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78  
TYPE1 BULL-ROSE

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE
2	2.40E+09	26	9.43E+04	437	1.14E+03	2	2.43E+09	26	1.57E+05	437	1.62E+03	2	2.43E+09	26	1.57E+05
3	1.10E+08	47	1.65E+04	706	1.76E+02	3	1.20E+08	47	3.31E+04	706	3.17E+02	3	1.20E+08	47	3.31E+04
5	5.43E+06	67	7.74E+03	1011	8.54E+00	5	1.16E+07	67	3.87E+01	1011	3.11E+01	5	1.16E+07	67	3.87E+01
7	2.98E+06	87	4.62E+03	1316	5.82E+00	7	6.43E+06	87	6.94E+03	1316	2.54E+01	7	6.43E+06	87	6.94E+03
9	1.48E+06	108	7.89E+03	1622	5.82E+00	9	5.18E+06	108	2.67E+04	1622	1.79E+01	9	5.18E+06	108	2.67E+04
11	2.96E+06	128	5.82E+03	1927	0.	11	3.71E+06	128	5.98E+07	1927	2.35E+00	11	3.71E+06	128	5.98E+07
12	9.87E+05	148	1.83E+03	2233	0.	12	3.82E+06	148	5.49E+03	2233	0.	12	3.82E+06	148	5.49E+03
14	1.23E+06	169	8.15E+02	2538	0.	14	2.83E+06	169	3.78E+03	2538	0.	14	2.83E+06	169	3.78E+03
16	2.45E+05	189	4.44E+03	2843	0.	16	2.87E+06	189	4.90E+03	2843	0.	16	2.87E+06	189	4.90E+03
18	9.88E+05	209	4.44E+03	3149	0.	18	7.41E+05	209	9.81E+03	3149	0.	18	7.41E+05	209	9.81E+03
19	9.88E+05	230	9.77E+02	3454	0.	19	9.88E+05	230	1.96E+03	3454	0.	19	9.88E+05	230	1.96E+03
21	2.47E+05	250	2.17E+03	3760	0.	21	1.73E+06	250	5.45E+03	3760	0.	21	1.73E+06	250	5.45E+03
23	2.47E+05	271	2.62E+03	4065	0.	23	1.46E+06	271	4.62E+03	4065	0.	23	1.46E+06	271	4.62E+03
25	2.47E+05	291	3.16E+03	4370	0.	25	2.47E+06	291	3.92E+03	4370	0.	25	2.47E+06	291	3.92E+03
27	2.47E+05	311	2.75E+03	4676	0.	27	9.09E+05	311	3.47E+03	4676	0.	27	9.09E+05	311	3.47E+03
TOTALS				TOTALS				TOTALS				TOTALS			
IMC	7.21E-05	3.47E-04	2.39E-03	2.74E-03	IMC	1.65E-04	6.38E-04	5.35E-03	5.96E-03	IMC	1.65E-04	6.38E-04	5.35E-03	5.96E-03	5.96E-03
WED D	11	117	277	288	WED D	21	107	357	329	WED D	21	107	357	329	329

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1004000

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1004000

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	ALT (KM)
2	2.45E+09	26	1.35E+05	437	1.05E+03	2.48E+02	9.55
3	1.42E+08	47	6.60E+04	706	2.24E+02	9.93E+01	7
5	9.38E+06	67	7.76E+03	1011	2.16E+01	9.52E+00	-46.05C
7	5.68E+06	87	1.45E+04	1716	1.64E+01	9.49E+00	FPT -43.9C
9	3.70E+06	108	3.99E+04	1622	7.25E+00	2.78E+00	FAS (W/S)
11	3.70E+06	128	1.97E+04	1927	1.19E+00	0.	137.31
12	3.74E+06	148	2.20E+04	2233	6.29E-01	6.27E-01	243
14	2.71E+06	169	1.35E+04	2538	0.	0.	3149
16	2.56E+06	189	7.09E+03	2843	0.	0.	3760
18	1.37E+06	209	3.29E+03	3149	0.	0.	4065
19	4.93E+05	230	6.05E+03	3454	0.	0.	4170
21	0.	250	3.25E+03	3760	0.	0.	4676
23	4.94E+05	271	2.81E+03	4065	0.	0.	TOTALS
25	4.94E+05	291	2.42E+03	4170	0.	0.	1.00E-04
27	2.47E+05	311	2.16E+03	4676	0.	0.	3.53E-03
IMC	1.00E-04	14	1.10E-03	88	0.	0.	282
4ED 0							352

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 10140130

AFML CIRRUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1004000

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	ALT (KM)
2	2.50E+09	26	1.56E+05	437	4.25E+02	1.19E+01	9.54
3	1.24E+08	47	1.29E+04	706	1.12E+02	1.91E+01	T -46.03C
5	2.71E+06	67	1.47E+03	1011	5.51E+00	5.05E-01	FPT -43.8C
7	3.69E+06	87	2.30E+03	1716	5.27E+00	0.	TAS (W/S)
9	2.56E+06	108	1.57E+04	1622	3.69E+00	0.	137.11
11	1.23E+06	128	6.96E+03	1927	0.	0.	2.61E-01
12	7.38E+05	148	1.00E+04	2233	0.	0.	FORM F .14
14	1.72E+06	169	1.05E+04	2538	0.	0.	NTIN/M**3
16	1.23E+06	189	2.11E+04	2843	0.	0.	1.6934E+03
18	4.92E+05	209	1.73E+04	3149	0.	0.	TOTALS
19	9.33E+05	230	6.82E+03	3454	0.	0.	1.36E-04
21	1.23E+06	250	1.08E+03	3760	0.	0.	321
23	9.65E+05	271	9.72E+02	4065	0.	0.	209
25	4.98E+05	291	8.71E+02	4170	0.	0.	1.94E-03
27	4.92E+05	311	7.69E+02	4676	0.	0.	5.00E-05
IMC	9.54E-05	10	5.00E-04	86	0.	0.	2.7272E+03
4ED 0							704

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18150100

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18149100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE
2	2.59E+09	26	3.26E+04	2	2.65E+09	26	1.63E+05
3	1.31E+08	47	3.37E+04	3	1.28E+08	47	1.11E+05
5	2.82E+06	67	1.59E+04	5	4.35E+06	67	1.51E+04
7	2.52E+06	87	1.85E+04	7	5.63E+06	87	2.39E+04
9	7.64E+05	108	3.86E+04	9	3.64E+06	108	7.16E+04
11	1.00E+06	128	1.31E+04	11	1.28E+06	128	2.37E+04
12	5.86E+05	148	1.03E+04	12	1.02E+06	148	1.42E+04
14	1.24E+06	169	0.	14	2.05E+06	169	9.38E+03
16	1.01E+06	189	0.	16	3.50E+06	189	2.53E+03
18	5.05E+05	209	0.	18	5.10E+05	209	3.68E+03
19	3.80E+06	230	0.	19	5.12E+05	230	0.
21	1.51E+06	250	0.	21	1.28E+06	250	0.
23	2.53E+05	271	0.	23	1.28E+06	271	0.
25	2.79E+06	291	0.	25	2.56E+05	291	0.
27	2.54E+06	311	0.	27	5.13E+05	311	0.
TOTALS				TOTALS			
INC	1.79E-04	24	2.13E-04	INC	1.00E-04	16	5.07E-04
RED D			59	RED D			51
			381				191
			5.04E-06				5.33E-07
			2.10E-04				5.86E-04
			59				61

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18150130

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18149130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE
2	2.56E+09	26	1.31E+05	2	2.61E+09	26	2.29E+05
3	1.34E+08	47	2.59E+04	3	1.51E+08	47	1.20E+05
5	2.57E+06	67	8.00E+03	5	7.55E+06	67	6.01E+04
7	2.57E+06	87	9.84E+03	7	4.88E+06	87	3.35E+04
9	5.18E+05	108	4.56E+04	9	3.00E+06	108	9.47E+04
11	1.27E+06	128	2.18E+04	11	2.31E+06	128	3.14E+04
12	2.60E+05	148	9.50E+03	12	1.80E+06	148	2.38E+04
14	7.78E+05	169	0.	14	3.85E+06	169	6.28E+03
16	5.10E+05	189	1.69E+03	16	2.31E+06	189	1.70E+04
18	7.73E+05	209	0.	18	1.29E+06	209	4.63E+03
19	2.67E+06	230	0.	19	1.80E+06	230	1.02E+03
21	2.61E+05	250	0.	21	1.28E+06	250	0.
23	0.	271	0.	23	1.28E+06	271	0.
25	1.30E+06	291	0.	25	1.80E+06	291	0.
27	1.82E+06	311	0.	27	5.13E+05	311	0.
TOTALS				TOTALS			
INC	1.13E-04	20	2.55E-04	INC	1.48E-04	19	7.31E-04
RED D			60	RED D			67
			0				0
			2.55E-04				7.31E-04
			60				67
			0				0
			2.55E-04				7.31E-04
			60				67

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 105100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (UM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.63E+09	2.64E+05	437 0.	9.57	
3	1.41E+08	1.30E+05	706 0.		
5	5.96E+06	2.44E+04	1011 0.	T -46.29C	
7	5.70E+06	4.12E+04	1316 0.	FPT -45.2C	
9	3.89E+06	1.08 1.12E+05	1622 0.	TAS (M/S)	
11	2.59E+06	1.28 3.42E+04	1927 0.	130.82	
12	1.29E+06	1.48 2.69E+04	2233 0.		
14	2.83E+06	1.69 8.71E+03	2538 0.	Z 4.24E-04	
16	2.07E+06	1.99 1.37E+04	2843 0.	FORM F .79	
18	1.03E+06	2.09 1.86E+03	3149 0.	NT(N/H*3)	
19	1.38E+06	230 1.03E+03	3654 0.	8.0217E+03	
21	1.55E+06	250 0.	3760 0.	TOTALS	
23	2.58E+05	271 0.	4065 0.	7.61E-04	
25	1.81E+06	291 0.	4370 0.	0	
27	5.19E+05	311 0.	4676 0.	7.61E-04	
IMC	1.28E-04	19	61		
WED D					

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 105200

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (UM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.70E+09	26 3.36E+04	437 3.86E+00	9.57	
3	1.40E+08	47 5.30E+04	706 0.		
5	4.22E+06	67 1.24E+04	1011 0.	T -46.42C	
7	5.02E+06	87 2.47E+03	1316 0.	FPT -45.0C	
9	4.32E+06	108 2.01E+04	1622 0.	TAS (M/S)	
11	1.32E+06	128 9.79E+03	1927 0.	128.46	
12	1.06E+06	148 9.79E+03	2233 0.		
14	1.32E+06	169 1.29E+04	2538 0.	Z 8.48E-04	
16	7.92E+05	189 3.14E+04	2843 0.	FORM F .71	
18	5.28E+05	209 9.51E+03	3149 0.	NT(N/H*3)	
19	5.28E+05	230 6.27E+03	3654 0.	3.4093E+03	
21	2.53E+05	250 5.81E+03	3760 0.	TOTALS	
23	7.92E+05	271 0.	4065 0.	3.29E-06	
25	5.59E+05	291 0.	4370 0.	6.31E-04	
27	1.06E+06	311 0.	4676 0.	191	
IMC	9.41E-05	16	85		
WED D					

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1051130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (UM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.48E+09	26 2.99E+05	437 0.	9.56	
3	1.34E+08	47 1.66E+05	706 0.		
5	7.31E+06	67 1.63E+04	1011 0.	T -46.15C	
7	6.80E+06	87 2.44E+04	1316 0.	FPT -45.2C	
9	2.81E+06	108 6.83E+04	1622 0.	TAS (M/S)	
11	3.80E+06	128 1.93E+04	1927 0.	129.64	
12	2.59E+05	148 2.13E+04	2233 0.		
14	1.31E+06	169 1.28E+04	2538 0.	Z 6.18E-04	
16	1.31E+06	189 1.65E+04	2843 0.	FORM F .70	
18	1.03E+06	209 1.14E+04	3149 0.	NT(N/H*3)	
19	5.19E+05	230 3.11E+03	3654 0.	7.7076E+03	
21	2.80E+05	250 1.15E+03	3760 0.	TOTALS	
23	5.21E+05	271 0.	4065 0.	8.09E-04	
25	2.88E+05	291 0.	4370 0.	0	
27	1.84E+06	311 0.	4676 0.	8.09E-04	
IMC	9.61E-05	16	68		
WED D					

AFML CIRRUS STUDY BY AFGL  
FLIGHT: E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1052130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (UM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.76E+09	26 3.35E+04	437 0.	9.57	
3	1.47E+08	47 0.	706 0.		
5	3.16E+06	67 0.	1011 0.	T -46.45C	
7	1.05E+06	87 2.46E+03	1316 0.	FPT -44.6C	
9	1.85E+06	108 1.67E+03	1622 0.	TAS (M/S)	
11	1.85E+06	128 2.46E+03	1927 0.	128.69	
12	7.90E+05	148 3.90E+03	2233 0.		
14	7.90E+05	169 3.22E+03	2538 0.	Z 3.25E-04	
16	5.27E+05	189 6.08E+03	2843 0.	FORM F .78	
18	2.63E+05	209 4.74E+03	3149 0.	NT(N/H*3)	
19	0.	230 0.	3654 0.	5.3559E+02	
21	0.	250 0.	3760 0.	TOTALS	
23	0.	271 2.49E+02	4065 0.	1.71E-04	
25	0.	291 4.97E+02	4370 0.	87	
27	0.	311 9.94E+02	4676 0.		
IMC	4.31E-05	2	0		
WED D					

AFML CIRPUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 18153180

SIZE (MU)	PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB) 202.40
	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	
2	2.03E+09	26	1.01E+05	437	6.43E-01
3	1.43E+08	47	8.83E+03	706	0.
5	3.43E+06	67	8.27E+03	1011	0.
7	3.16E+06	87	2.47E+03	1716	0.
9	1.82E+06	108	1.68E+04	1622	0.
11	1.32E+06	128	1.12E+04	1927	0.
12	5.27E+05	148	7.82E+03	2233	0.
14	1.32E+06	169	5.84E+03	2538	0.
16	1.06E+06	189	1.48E+04	2843	0.
18	2.64E+05	209	6.85E+03	3149	0.
19	7.91E+05	230	1.05E+03	3454	0.
21	2.64E+05	250	0.	3760	0.
23	5.27E+05	271	0.	4065	0.
25	5.27E+05	291	0.	4370	0.
27	0.	311	0.	4676	0.
IMC	7.02E-05	9	3.16E-04	5.49E-07	TOTALS
4ED 0			61	191	3.16E-04
					81

AFML CIRPUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 18154180

SIZE (MU)	PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB) 202.46
	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	
2	2.08E+09	26	0.	437	6.50E+00
3	1.25E+08	47	0.	706	0.
5	7.98E+05	67	4.19E+03	1011	0.
7	2.68E+05	87	0.	1316	0.
9	5.31E+05	108	6.77E+03	1622	0.
11	2.67E+05	128	0.	1927	0.
12	2.65E+05	148	0.	2233	0.
14	2.65E+05	169	0.	2538	0.
16	0.	189	0.	2843	0.
18	0.	209	1.91E+03	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	0.
23	0.	271	2.51E+02	4065	0.
25	0.	291	5.03E+02	4370	0.
27	2.65E+05	311	1.01E+03	4676	0.
IMC	3.91E-05	2	7.63E-05	5.55E-06	TOTALS
4ED 0			123	191	0.18E-05
					125

AFML CIRPUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 18153130

SIZE (MU)	PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB) 202.35
	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	
2	2.02E+09	26	6.71E+04	437	3.24E+00
3	1.47E+08	47	5.32E+04	706	0.
5	5.04E+06	67	8.30E+03	1011	0.
7	1.59E+06	87	1.98E+04	1316	0.
9	1.06E+06	108	7.37E+04	1622	0.
11	1.06E+06	128	2.75E+04	1927	0.
12	1.59E+06	148	1.86E+04	2233	0.
14	1.06E+06	169	6.06E+03	2538	0.
16	5.11E+05	189	1.40E+04	2843	0.
18	4.30E+05	209	2.66E+03	3149	0.
19	1.33E+06	230	1.05E+03	3454	0.
21	0.	250	2.33E+03	3760	0.
23	5.31E+05	271	1.54E+03	4065	0.
25	1.06E+06	291	1.02E+03	4370	0.
27	2.05E+05	311	6.74E+02	4676	0.
IMC	8.71E-05	14	5.29E-04	2.76E-06	TOTALS
4ED 0			74	191	5.31E-04
					74

AFML CIRPUS STUDY BY AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 18154130

SIZE (MU)	PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB) 202.43
	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	
2	2.94E+09	26	0.	437	2.60E+01
3	1.41E+08	47	8.89E+03	706	0.
5	1.86E+06	67	8.36E+03	1011	0.
7	2.66E+06	87	0.	1316	0.
9	1.07E+06	108	1.10E+04	1622	0.
11	1.33E+06	128	2.51E+03	1927	0.
12	2.06E+05	148	2.96E+03	2233	0.
14	2.66E+05	169	2.44E+03	2538	0.
16	2.66E+05	189	1.76E+03	2843	0.
18	0.	209	2.88E+03	3149	0.
19	2.66E+05	230	2.11E+03	3454	0.
21	2.66E+05	250	1.17E+02	3760	0.
23	5.33E+05	271	1.73E+03	4065	0.
25	2.66E+05	291	2.55E+03	4370	0.
27	5.32E+05	311	3.77E+03	4676	0.
IMC	6.43E-05	4	3.11E-04	2.22E-05	TOTALS
4ED 0			121	191	3.53E-04
					123

AFWL CIRRUS STUDY BY AFGL  
ON 04 APR 78 30 SECOND AVERAGING  
05E INTERVAL START: 18456100

[illegible]

AFWL CIRRUS STUDY 9Y AFGL  
FLIGHT# E70-14 ON 04 APR 78 30 SECOND AVERAGING  
TYPE# BULL-ROSE INTERVAL START# 10156130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)						PRESS (MB)		PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)						PRESS (MB)		
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	PRECIP PROBE	ALT (KM)	202.40	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	PRECIP PROBE	ALT (KM)	202.01	
2	2.98E+09	26	6.76E+04	437	2	2.98E+09	9.56	2	2.92E+09	26	0.	437	1.90E+02	ALT	4.57	
3	1.38E+08	47	0.	706	3	1.36E+08	0.	3	1.36E+08	47	0.	706	1.53E+00		5.57	
5	1.05E+06	67	0.	1011	5	T -46.84C		5	4.47E+06	67	0.	1011	0.			
7	7.30E+05	87	4.97E+03	1316	7	2.09E+06		7	2.09E+06	87	0.	1316	0.			
9	2.68E+05	108	8.45E+03	1622	9	FPT -44.3C		9	1.05E+06	108	1.34E+04	1622	0.			
11	5.32E+05	128	7.51E+03	1927	11	2.37E+06		11	2.37E+06	128	2.93E+03	1927	0.			
12	7.98E+05	148	1.97E+04	2233	12	TAS (M/S)		12	1.04E+06	148	2.91E+03	2233	0.			
14	7.98E+05	169	6.13E+02	2538	14	127.40		14	1.34E+06	169	1.61E+03	2538	0.	FPT -42.8C		
16	0.	189	1.76E+03	2843	16			16	5.24E+05	189	5.20E+03	2843	0.	TAS (M/S)		
18	2.46E+05	209	2.07E+03	3149	18	2.9.55E-04		18	2.65E+05	209	1.91E+03	3149	0.	126.97		
19	2.66E+05	210	3.16E+03	3454	19			19	5.24E+05	210	4.17E+03	3454	0.	2.3.08E-03		
21	5.32E+05	250	1.17E+03	3760	21	FORM F .6W		21	0.	250	1.16E+03	3760	0.			
23	5.32E+05	271	1.36E+03	4065	23			23	5.25E+05	271	1.52E+03	4065	0.	FORM F .37		
25	5.32E+05	291	1.59E+03	4370	25	MTIN/M <sup>3</sup> 3		25	2.65E+05	291	2.03E+03	4370	0.	MTIN/M <sup>3</sup> 3		
27	2.66E+05	311	1.05E+03	4676	27	7.6039E+02		27	2.65E+05	311	1.44E+03	4676	0.	1.6831E+03		
TOTALS								TOTALS								TOTALS
INC	6.68E-05	4	2.67E-04	103	2.27E-05	2.86E-04	308	INC	6.70E-05	6	2.98E-04	101	1.56E-04	4.46E-04		
MEQ	0			191				MEQ	0			194			136	

AFWL CIRRUS STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE:1 BULL-ROSE INTERVAL START: 18156100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	
2	2.84E+09	26	1.02E+05	437	5.63E+02	9.65	
3	1.50E+08	47	1.38E+05	706	2.07E+00		
5	9.90E+06	67	2.58E+04	1011	0.	T -47.12C	
7	7.76E+06	87	2.58E+04	1716	0.		
9	6.43E+06	100	6.29E+04	1622	0.	FPT -43.5C	
11	4.01E+06	128	2.77E+04	1927	0.		
12	1.60E+06	148	1.49E+04	2233	0.	TAS (M/S)	
14	4.55E+06	169	1.06E+04	2578	0.	126.58	
16	2.14E+06	189	1.59E+04	2643	0.		
18	1.34E+06	209	1.58E+04	3149	0.	2 9.61E-03	
19	2.67E+06	230	1.27E+04	3454	0.		
21	1.84E+06	250	4.7E+03	3760	0.	FORM F .41	
23	1.07E+06	271	6.7E+03	4065	0.		
25	1.61E+06	291	9.63E+03	4770	0.	NT(N/M**3)	
27	8.03E+05	311	6.49E+03	4676	0.	7.6990E+03	
TOTALS				1.39E-03	4.59E-04	1.05E-03	
INC	1.40E-04	17	97				
4ED 0.							

AFWL CIRRUS STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE:1 BULL-ROSE INTERVAL START: 18157100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	
2	2.80E+09	26	6.88E+04	437	6.57E+02	9.63	
3	1.50E+08	47	2.69E+04	706	5.20E+00		
5	4.82E+06	67	4.20E+03	1011	0.	T -47.01C	
7	2.68E+06	87	0.	1716	0.		
9	2.68E+06	100	5.11E+03	1622	0.	FPT -43.5C	
11	4.29E+06	128	8.84E+03	1927	0.		
12	1.34E+06	148	1.99E+03	2233	0.	TAS (M/S)	
14	8.05E+05	169	1.63E+03	2578	0.	126.30	
16	2.14E+06	189	4.47E+03	2643	0.		
18	2.69E+05	209	6.76E+03	3149	0.	2 1.12E-02	
19	2.68E+05	230	1.06E+04	3454	0.		
21	8.06E+05	250	5.89E+03	3760	0.	FORM F .55	
23	8.01E+05	271	7.01E+03	4065	0.		
25	2.69E+05	291	4.34E+03	4770	0.	NT(N/M**3)	
27	2.68E+05	311	5.86E+03	4676	0.	2.1366E+03	
TOTALS				1.40E-03	5.67E-04	1.40E-03	
INC	8.64E-05	12	118				
4ED 0							

AFWL CIRRUS STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE:1 BULL-ROSE INTERVAL START: 18159130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	
2	2.93E+09	26	1.35E+05	437	4.19E+02	9.66	
3	1.87E+08	47	6.22E+04	706	5.13E-01		
5	9.90E+06	67	2.49E+04	1011	0.	T -47.12C	
7	8.67E+06	87	2.27E+04	1716	0.		
9	8.74E+06	100	3.69E+04	1622	0.	FPT -43.9C	
11	3.97E+06	128	1.87E+04	1927	0.		
12	2.12E+06	148	1.28E+04	2233	0.	TAS (M/S)	
14	3.10E+06	169	1.05E+04	2578	0.	128.04	
16	3.44E+06	189	2.67E+04	3149	0.	2 7.58E-03	
18	3.97E+06	209	2.67E+04	3454	0.		
19	1.86E+06	230	8.18E+03	3760	0.	FORM F .52	
21	1.06E+06	250	8.18E+03	4065	0.		
23	1.06E+06	271	8.97E+03	4770	0.	NT(N/M**3)	
25	1.59E+06	291	8.97E+03	4770	0.	5.9032E+03	
27	7.33E+05	311	5.85E+03	4676	0.		
TOTALS				1.50E-03	3.06E-04	1.81E-03	
INC	1.74E-04	18	99				
4ED 0							

AFWL CIRRUS STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE:1 BULL-ROSE INTERVAL START: 18157130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	
2	2.91E+09	26	6.85E+04	437	3.31E+02	9.64	
3	1.50E+08	47	5.40E+04	706	5.20E-01		
5	7.25E+06	67	5.	1011	0.	T -47.19C	
7	2.25E+06	87	2.51E+03	1716	0.		
9	2.69E+06	100	1.20E+03	1622	0.	FPT -43.4C	
11	2.96E+06	128	0.37E+03	1927	0.		
12	2.86E+06	148	4.98E+03	2233	0.	TAS (M/S)	
14	1.87E+06	169	5.75E+03	2578	0.	126.07	
16	1.81E+06	189	1.33E+04	3149	0.		
18	2.68E+05	209	7.74E+03	3454	0.	2 5.47E-03	
19	1.61E+06	230	1.28E+04	3760	0.		
21	5.38E+05	250	4.73E+03	4065	0.	FORM F .51	
23	1.07E+06	271	5.43E+03	4770	0.		
25	1.07E+06	291	6.23E+03	4378	0.	NT(N/M**3)	
27	8.66E+05	311	4.14E+03	4676	0.	2.9516E+03	
TOTALS				1.40E-03	2.43E-04	1.40E-03	
INC	1.21E-04	19	104				
4ED 0							



AFML CIRRHUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1900180

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	3.05E+09	26	3.26E+04	1.23E+00	278.03
3	1.46E+08	47	0.	1.98E+00	9.66
5	5.13E+05	67	0.	0.	-47.06C
7	5.13E+05	87	2.39E+03	1316	0.
9	5.13E+05	108	8.14E+03	1622	0.
11	2.58E+05	128	1.21E+03	1927	0.
12	5.13E+05	148	0.	2233	0.
14	5.13E+05	169	0.	2538	0.
16	2.58E+05	189	8.45E+02	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	2.57E+05	250	0.	3760	0.
23	2.58E+05	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	0.	311	0.	4676	0.
TOTALS				1.04E-05	4.39E-05
INC	4.47E-05	2	2.34E-05	58	60
4ED 0					

AFML CIRRHUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1805980

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	3.06E+09	26	6.60E+04	4.23E+02	278.38
3	1.46E+08	47	6.09E+04	5.00E+01	7
5	8.07E+06	67	2.43E+04	0.	-47.09C
7	6.69E+06	87	3.31E+04	0.	0.
9	6.69E+06	108	3.31E+04	1622	0.
11	5.73E+06	128	4.92E+03	1927	0.
12	1.02E+06	148	3.67E+03	2233	0.
14	2.08E+06	169	2.36E+03	2538	0.
16	1.50E+06	189	3.44E+03	2843	0.
18	1.04E+06	209	4.60E+03	3149	0.
19	5.22E+05	230	1.55E+04	3454	0.
21	5.19E+05	250	9.15E+03	3760	0.
23	1.04E+06	271	9.15E+03	4065	0.
25	1.30E+06	291	9.15E+03	4370	0.
27	1.04E+06	311	5.98E+03	4676	0.
TOTALS				3.09E-04	1.89E-03
INC	1.32E-04	17	1.08E-03	192	121
4ED 0					

AFML CIRRHUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1910030

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	3.09E+09	26	0.	2.48E+00	9.67
3	1.51E+08	47	0.	0.	-47.14C
5	5.10E+05	67	0.	1011	0.
7	2.55E+05	87	0.	1316	0.
9	0.	108	1.62E+03	1622	0.
11	2.55E+05	128	0.	1927	0.
12	0.	148	0.	2233	0.
14	0.	169	7.80E+02	2538	0.
16	0.	189	8.41E+02	2843	0.
18	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	2.54E+05	250	0.	3760	0.
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	0.
27	2.55E+05	311	0.	4676	0.
TOTALS				1.28E-05	2.42E-06
INC	4.29E-05	2	1.28E-05	79	191
4ED 0					

AFML CIRRHUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18159130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	3.04E+09	26	3.27E+04	1.19E+01	278.24
3	1.51E+08	47	1.72E+04	0.	9.66
5	1.06E+06	67	1.21E+04	0.	-47.04C
7	3.61E+06	87	0.	1816	0.
9	7.72E+05	108	6.59E+03	1622	0.
11	7.72E+05	128	1.21E+03	1927	0.
12	5.13E+05	148	7.82E+02	2233	0.
14	5.13E+05	169	7.82E+02	2538	0.
16	2.58E+05	189	8.51E+02	2843	0.
18	7.72E+05	209	2.78E+03	3149	0.
19	5.10E+05	230	5.10E+03	3454	0.
21	0.	250	2.27E+03	3760	0.
23	5.13E+05	271	1.74E+03	4065	0.
25	2.57E+05	291	1.74E+03	4370	0.
27	0.	311	1.63E+03	4676	0.
TOTALS				1.82E-05	2.72E-04
INC	6.01E-05	3	2.62E-04	191	104
4ED 0					

AFML CIRRUS STUDY 3Y AFGL  
FLIGHT 178-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 19101100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	PRECIP PROBE
2	1.12E+09	26	0.	9.66	1.61E+01
3	1.47E+08	47	1.70E+04	0.	0.
4	1.78E+06	67	0.	0.	0.
5	1.53E+06	67	0.	0.	0.
6	1.53E+06	67	0.	0.	0.
7	5.09E+05	108	0.09E+07	0.	0.
8	1.42E+06	128	3.59E+03	0.	0.
9	0.	148	4.71E+07	0.	0.
10	0.	168	7.66E+02	0.	0.
11	1.27E+06	188	4.19E+03	0.	0.
12	1.11E+05	208	2.75E+03	0.	0.
13	2.54E+05	228	5.03E+03	0.	0.
14	2.54E+05	248	1.12E+03	0.	0.
15	5.10E+05	268	1.03E+07	0.	0.
16	0.	288	9.81E+02	0.	0.
17	0.	308	9.17E+02	0.	0.
18	0.	328	0.	0.	0.
19	0.	348	0.	0.	0.
20	0.	368	0.	0.	0.
21	0.	388	0.	0.	0.
22	0.	408	0.	0.	0.
23	0.	428	0.	0.	0.
24	0.	448	0.	0.	0.
25	0.	468	0.	0.	0.
26	0.	488	0.	0.	0.
27	0.	508	0.	0.	0.
TOTALS	5.45E+05	2.43E+04	1.38E+05	2.57E+04	1.38E+05
UNC	0	0	0	0	0
MEAN	0	0	0	0	0

82

AFML CIRRUS STUDY 3Y AFGL  
FLIGHT 178-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 19102100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	PRECIP PROBE
2	3.06E+09	26	0.	9.67	2.46E+00
3	1.88E+08	47	0.	0.	0.
4	5.07E+05	67	0.	0.	0.
5	5.07E+05	67	0.	0.	0.
6	2.94E+05	108	3.23E+02	0.	0.
7	7.62E+05	128	2.39E+02	0.	0.
8	0.	148	1.88E+02	0.	0.
9	2.54E+05	168	0.	0.	0.
10	1.02E+06	188	0.	0.	0.
11	0.	208	1.87E+03	0.	0.
12	2.54E+05	228	1.01E+07	0.	0.
13	2.54E+05	248	0.	0.	0.
14	0.	268	2.39E+02	0.	0.
15	0.	288	4.66E+02	0.	0.
16	0.	308	4.70E+02	0.	0.
17	0.	328	9.35E+02	0.	0.
18	0.	348	0.	0.	0.
19	0.	368	0.	0.	0.
20	0.	388	0.	0.	0.
21	0.	408	0.	0.	0.
22	0.	428	0.	0.	0.
23	0.	448	0.	0.	0.
24	0.	468	0.	0.	0.
25	0.	488	0.	0.	0.
26	0.	508	0.	0.	0.
TOTALS	4.53E+05	8.62E+05	2.14E+06	9.93E+05	103
UNC	0	0	0	0	0
MEAN	0	0	0	0	0

AFML CIRRUS STUDY 3Y AFGL  
FLIGHT 178-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 19101133

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	PRECIP PROBE
2	3.47E+09	26	1.23E+04	9.66	7.35E+02
3	1.56E+08	47	1.40E+04	0.	1.48E+00
4	5.60E+06	67	1.39E+03	0.	0.
5	3.56E+06	67	7.14E+02	0.	0.
6	1.02E+06	108	2.59E+04	0.	0.
7	2.54E+06	128	1.06E+04	0.	0.
8	2.54E+06	148	9.87E+07	0.	0.
9	7.63E+05	168	5.84E+03	0.	0.
10	1.02E+06	188	5.04E+03	0.	0.
11	1.02E+06	208	1.78E+04	0.	0.
12	7.63E+05	228	5.06E+03	0.	0.
13	7.63E+05	248	4.57E+03	0.	0.
14	7.63E+05	268	4.57E+03	0.	0.
15	7.63E+05	288	4.57E+03	0.	0.
16	7.63E+05	308	4.57E+03	0.	0.
17	7.63E+05	328	4.57E+03	0.	0.
18	7.63E+05	348	4.57E+03	0.	0.
19	7.63E+05	368	4.57E+03	0.	0.
20	7.63E+05	388	4.57E+03	0.	0.
21	7.63E+05	408	4.57E+03	0.	0.
22	7.63E+05	428	4.57E+03	0.	0.
23	7.63E+05	448	4.57E+03	0.	0.
24	7.63E+05	468	4.57E+03	0.	0.
25	7.63E+05	488	4.57E+03	0.	0.
26	7.63E+05	508	4.57E+03	0.	0.
TOTALS	9.03E+05	7.77E+04	2.68E+04	1.05E+03	2.68E+04
UNC	0	0	0	0	0
MEAN	0	0	0	0	0

AFML CIRRUS STUDY 3Y AFGL  
FLIGHT 178-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 19102130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	ALT (KM)	PRECIP PROBE
2	3.10E+09	26	0.	9.67	2.7.81
3	1.41E+08	47	8.44E+02	0.	0.
4	5.06E+05	67	0.	0.	0.
5	5.06E+05	67	0.	0.	0.
6	2.94E+05	108	3.21E+02	0.	0.
7	7.62E+05	128	2.39E+02	0.	0.
8	0.	148	1.88E+02	0.	0.
9	2.54E+05	168	0.	0.	0.
10	1.01E+06	188	0.	0.	0.
11	0.	208	1.87E+03	0.	0.
12	2.54E+05	228	1.01E+07	0.	0.
13	2.54E+05	248	0.	0.	0.
14	0.	268	2.39E+02	0.	0.
15	0.	288	4.66E+02	0.	0.
16	0.	308	4.70E+02	0.	0.
17	0.	328	9.35E+02	0.	0.
18	0.	348	0.	0.	0.
19	0.	368	0.	0.	0.
20	0.	388	0.	0.	0.
21	0.	408	0.	0.	0.
22	0.	428	0.	0.	0.
23	0.	448	0.	0.	0.
24	0.	468	0.	0.	0.
25	0.	488	0.	0.	0.
26	0.	508	0.	0.	0.
TOTALS	4.03E+05	8.40E+05	2.40E+06	2.40E+06	60
UNC	0	0	0	0	0
MEAN	0	0	0	0	0

AFML CIRCUIT STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 19103100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE
2	3.12E+09	26	0.	437	1.65E+01	2	3.08E+09	26	0.	437	0.	2	3.08E+09	26	0.
3	1.42E+08	47	0.	706	0.	3	1.59E+08	47	0.	706	0.	3	1.59E+08	47	0.
5	1.00E+06	67	1.18E+04	1011	0.	5	0.	67	0.	1011	0.	5	0.	67	0.
7	2.50E+05	87	2.34E+03	1716	0.	7	0.	87	0.	1716	0.	7	0.	87	0.
9	7.52E+05	108	1.59E+03	1622	0.	9	0.	108	0.	1622	0.	9	0.	108	0.
11	7.52E+05	128	0.	1927	0.	11	0.	128	0.	1927	0.	11	0.	128	0.
12	5.02E+05	148	9.29E+02	2233	0.	12	2.49E+05	148	9.29E+02	2233	0.	12	2.49E+05	148	9.29E+02
14	2.51E+05	169	7.56E+02	2538	0.	14	0.	169	0.	2538	0.	14	0.	169	0.
16	5.02E+05	189	0.	2843	0.	16	0.	189	0.	2843	0.	16	0.	189	0.
18	2.52E+05	209	0.	3149	0.	18	0.	209	0.	3149	0.	18	0.	209	0.
19	0.	230	9.95E+02	3454	0.	19	0.	230	0.	3454	0.	19	0.	230	0.
21	0.	250	0.	3760	0.	21	0.	250	0.	3760	0.	21	0.	250	0.
23	0.	271	4.83E+02	4065	0.	23	2.49E+05	271	0.	4065	0.	23	2.49E+05	271	0.
25	5.01E+05	291	9.65E+02	4370	0.	25	0.	291	0.	4370	0.	25	0.	291	0.
27	0.	311	1.93E+02	4676	0.	27	0.	311	0.	4676	0.	27	0.	311	0.
TOTALS				TOTALS				TOTALS				TOTALS			
IMC	4.95E-05	1.17E-04	1.41E-05	191	1.46E-06	IMC	3.91E-03	1.46E-06	0.	0.	0.	IMC	3.91E-03	1.46E-06	0.
MEAN	0	129	0	0	0	MEAN	0	0	0	0	0	MEAN	0	0	0

AFML CIRCUIT STUDY 9Y AFGL  
FLIGHT# E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 19104130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)			
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE
2	3.11E+09	26	3.10E+04	437	7.32E+00	2	3.05E+09	26	0.	437	1.81E+00	2	3.05E+09	26	0.
3	1.47E+08	47	3.34E+04	706	0.	3	1.64E+08	47	0.	706	0.	3	1.64E+08	47	0.
5	7.50E+05	67	3.92E+03	1011	0.	5	0.	67	0.	1011	0.	5	0.	67	0.
7	5.00E+05	87	7.01E+02	1316	0.	7	0.	87	0.	1316	0.	7	0.	87	0.
9	1.25E+06	108	1.59E+04	1622	0.	9	0.	108	0.	1622	0.	9	0.	108	0.
11	2.50E+05	128	9.42E+03	1927	0.	11	0.	128	0.	1927	0.	11	0.	128	0.
12	7.50E+05	148	5.56E+03	2233	0.	12	0.	148	0.	2233	0.	12	0.	148	0.
14	7.50E+05	169	1.53E+03	2538	0.	14	0.	169	0.	2538	0.	14	0.	169	0.
16	5.00E+05	189	2.47E+03	2843	0.	16	0.	189	0.	2843	0.	16	0.	189	0.
18	5.00E+05	209	9.01E+02	3149	0.	18	0.	209	0.	3149	0.	18	0.	209	0.
19	2.50E+05	230	0.	3454	0.	19	0.	230	0.	3454	0.	19	0.	230	0.
21	0.	250	0.	3760	0.	21	0.	250	0.	3760	0.	21	0.	250	0.
23	0.	271	0.	4065	0.	23	0.	271	0.	4065	0.	23	0.	271	0.
25	2.50E+05	291	0.	4370	0.	25	0.	291	0.	4370	0.	25	0.	291	0.
27	0.	311	0.	4676	0.	27	0.	311	0.	4676	0.	27	0.	311	0.
TOTALS				TOTALS				TOTALS				TOTALS			
IMC	5.08E-05	1.44E-04	6.25E-06	191	1.55E-06	IMC	3.56E-05	1.55E-06	0.	0.	0.	IMC	3.56E-05	1.55E-06	0.
MEAN	0	63	0	0	0	MEAN	0	0	0	0	0	MEAN	0	0	0

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 19105100

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-16 ON 04 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 19105100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE
2	3.11E+09	26	0.	2	3.12E+09	26	0.	ALT	9.68	ALT	9.68
3	1.49E+08	47	0.	3	1.56E+08	47	0.	T	-46.95C	T	-47.11C
5	0.	67	0.	5	2.47E+05	67	0.	FPT	-47.2C	FPT	-48.0C
7	0.	87	0.	7	0.	87	0.	TAS	(M/S)	TAS	(M/S)
9	0.	108	0.	9	0.	108	0.	137.72	137.72	137.01	137.01
11	0.	128	0.	11	0.	128	0.	Z	5.53E-05	Z	4.83E-04
12	0.	148	0.	12	0.	148	0.	FORM	F1.8J	FORM	F.26
14	0.	169	0.	14	0.	169	0.	NT(N/M <sup>3</sup> )	4.370	NT(N/M <sup>3</sup> )	4.370
16	0.	189	0.	16	0.	189	0.	1.1137E+00	1.1137E+00	3.5845E+01	3.5845E+01
18	0.	209	0.	18	0.	209	0.	TOTALS		TOTALS	
20	0.	230	0.	20	0.	230	0.	IMC	3.53E-05	IMC	3.58E-05
22	0.	250	0.	22	0.	250	0.	4.11E-06	4.11E-06	7.55E-06	7.55E-06
24	0.	271	0.	24	0.	271	0.	191	191	301	301
26	0.	291	0.	26	0.	291	0.	4.99E-06	4.99E-06	0.	0.
28	0.	311	0.	28	0.	311	0.	301	301	0.	0.
30	0.	331	0.	30	0.	331	0.	4.99E-06	4.99E-06	0.	0.
32	0.	351	0.	32	0.	351	0.	301	301	0.	0.
34	0.	371	0.	34	0.	371	0.	4.99E-06	4.99E-06	0.	0.
36	0.	391	0.	36	0.	391	0.	301	301	0.	0.
38	0.	411	0.	38	0.	411	0.	4.99E-06	4.99E-06	0.	0.
40	0.	431	0.	40	0.	431	0.	301	301	0.	0.
42	0.	451	0.	42	0.	451	0.	4.99E-06	4.99E-06	0.	0.
44	0.	471	0.	44	0.	471	0.	301	301	0.	0.
46	0.	491	0.	46	0.	491	0.	4.99E-06	4.99E-06	0.	0.
48	0.	511	0.	48	0.	511	0.	301	301	0.	0.
50	0.	531	0.	50	0.	531	0.	4.99E-06	4.99E-06	0.	0.
52	0.	551	0.	52	0.	551	0.	301	301	0.	0.
54	0.	571	0.	54	0.	571	0.	4.99E-06	4.99E-06	0.	0.
56	0.	591	0.	56	0.	591	0.	301	301	0.	0.
58	0.	611	0.	58	0.	611	0.	4.99E-06	4.99E-06	0.	0.
60	0.	631	0.	60	0.	631	0.	301	301	0.	0.
62	0.	651	0.	62	0.	651	0.	4.99E-06	4.99E-06	0.	0.
64	0.	671	0.	64	0.	671	0.	301	301	0.	0.
66	0.	691	0.	66	0.	691	0.	4.99E-06	4.99E-06	0.	0.
68	0.	711	0.	68	0.	711	0.	301	301	0.	0.
70	0.	731	0.	70	0.	731	0.	4.99E-06	4.99E-06	0.	0.
72	0.	751	0.	72	0.	751	0.	301	301	0.	0.
74	0.	771	0.	74	0.	771	0.	4.99E-06	4.99E-06	0.	0.
76	0.	791	0.	76	0.	791	0.	301	301	0.	0.
78	0.	811	0.	78	0.	811	0.	4.99E-06	4.99E-06	0.	0.
80	0.	831	0.	80	0.	831	0.	301	301	0.	0.
82	0.	851	0.	82	0.	851	0.	4.99E-06	4.99E-06	0.	0.
84	0.	871	0.	84	0.	871	0.	301	301	0.	0.
86	0.	891	0.	86	0.	891	0.	4.99E-06	4.99E-06	0.	0.
88	0.	911	0.	88	0.	911	0.	301	301	0.	0.
90	0.	931	0.	90	0.	931	0.	4.99E-06	4.99E-06	0.	0.
92	0.	951	0.	92	0.	951	0.	301	301	0.	0.
94	0.	971	0.	94	0.	971	0.	4.99E-06	4.99E-06	0.	0.
96	0.	991	0.	96	0.	991	0.	301	301	0.	0.
98	0.	1011	0.	98	0.	1011	0.	4.99E-06	4.99E-06	0.	0.
100	0.	1031	0.	100	0.	1031	0.	301	301	0.	0.
102	0.	1051	0.	102	0.	1051	0.	4.99E-06	4.99E-06	0.	0.
104	0.	1071	0.	104	0.	1071	0.	301	301	0.	0.
106	0.	1091	0.	106	0.	1091	0.	4.99E-06	4.99E-06	0.	0.
108	0.	1111	0.	108	0.	1111	0.	301	301	0.	0.
110	0.	1131	0.	110	0.	1131	0.	4.99E-06	4.99E-06	0.	0.
112	0.	1151	0.	112	0.	1151	0.	301	301	0.	0.
114	0.	1171	0.	114	0.	1171	0.	4.99E-06	4.99E-06	0.	0.
116	0.	1191	0.	116	0.	1191	0.	301	301	0.	0.
118	0.	1211	0.	118	0.	1211	0.	4.99E-06	4.99E-06	0.	0.
120	0.	1231	0.	120	0.	1231	0.	301	301	0.	0.
122	0.	1251	0.	122	0.	1251	0.	4.99E-06	4.99E-06	0.	0.
124	0.	1271	0.	124	0.	1271	0.	301	301	0.	0.
126	0.	1291	0.	126	0.	1291	0.	4.99E-06	4.99E-06	0.	0.
128	0.	1311	0.	128	0.	1311	0.	301	301	0.	0.
130	0.	1331	0.	130	0.	1331	0.	4.99E-06	4.99E-06	0.	0.
132	0.	1351	0.	132	0.	1351	0.	301	301	0.	0.
134	0.	1371	0.	134	0.	1371	0.	4.99E-06	4.99E-06	0.	0.
136	0.	1391	0.	136	0.	1391	0.	301	301	0.	0.
138	0.	1411	0.	138	0.	1411	0.	4.99E-06	4.99E-06	0.	0.
140	0.	1431	0.	140	0.	1431	0.	301	301	0.	0.
142	0.	1451	0.	142	0.	1451	0.	4.99E-06	4.99E-06	0.	0.
144	0.	1471	0.	144	0.	1471	0.	301	301	0.	0.
146	0.	1491	0.	146	0.	1491	0.	4.99E-06	4.99E-06	0.	0.
148	0.	1511	0.	148	0.	1511	0.	301	301	0.	0.
150	0.	1531	0.	150	0.	1531	0.	4.99E-06	4.99E-06	0.	0.
152	0.	1551	0.	152	0.	1551	0.	301	301	0.	0.
154	0.	1571	0.	154	0.	1571	0.	4.99E-06	4.99E-06	0.	0.
156	0.	1591	0.	156	0.	1591	0.	301	301	0.	0.
158	0.	1611	0.	158	0.	1611	0.	4.99E-06	4.99E-06	0.	0.
160	0.	1631	0.	160	0.	1631	0.	301	301	0.	0.
162	0.	1651	0.	162	0.	1651	0.	4.99E-06	4.99E-06	0.	0.
164	0.	1671	0.	164	0.	1671	0.	301	301	0.	0.
166	0.	1691	0.	166	0.	1691	0.	4.99E-06	4.99E-06	0.	0.
168	0.	1711	0.	168	0.	1711	0.	301	301	0.	0.
170	0.	1731	0.	170	0.	1731	0.	4.99E-06	4.99E-06	0.	0.
172	0.	1751	0.	172	0.	1751	0.	301	301	0.	0.
174	0.	1771	0.	174	0.	1771	0.	4.99E-06	4.99E-06	0.	0.
176	0.	1791	0.	176	0.	1791	0.	301	301	0.	0.
178	0.	1811	0.	178	0.	1811	0.	4.99E-06	4.99E-06	0.	0.
180	0.	1831	0.	180	0.	1831	0.	301	301	0.	0.
182	0.	1851	0.	182	0.	1851	0.	4.99E-06	4.99E-06	0.	0.
184	0.	1871	0.	184	0.	1871	0.	301	301	0.	0.
186	0.	1891	0.	186	0.	1891	0.	4.99E-06	4.99E-06	0.	0.
188	0.	1911	0.	188	0.	1911	0.	301	301	0.	0.
190	0.	1931	0.	190	0.	1931	0.	4.99E-06	4.99E-06	0.	0.
192	0.	1951	0.	192	0.	1951	0.	301	301	0.	0.
194	0.	1971	0.	194	0.	1971	0.	4.99E-06	4.99E-06	0.	0.
196	0.	1991	0.	196	0.	1991	0.	301	301	0.	0.
198	0.	2011	0.	198	0.	2011	0.	4.99E-06	4.99E-06	0.	0.
200	0.	2031	0.	200	0.	2031	0.	301	301	0.	0.
202	0.	2051	0.	202	0.	2051	0.	4.99E-06	4.99E-06	0.	0.
204	0.	2071	0.	204	0.	2071	0.	301	301	0.	0.
206	0.	2091	0.	206	0.	2091	0.	4.99E-06	4.99E-06	0.	0.
208	0.	2111	0.	208	0.	2111	0.	301	301	0.	0.
210	0.	2131	0.	210	0.	2131	0.	4.99E-06	4.99E-06	0.	0.
212	0.	2151	0.	212	0.	2151	0.	301	301	0.	0.
214	0.	2171	0.	214	0.	2171	0.	4.99E-06	4.99E-06	0.	0.
216	0.	2191	0.	216	0.	2191	0.	301	301	0.	0.
218	0.	2211	0.	218	0.	2211	0.	4.99E-06	4.99E-06	0.	0.
220	0.	2231	0.	220	0.	2231	0.	301	301	0.	0.
222	0.	2251	0.	222	0.	2251	0.	4.99E-06	4.99E-06	0.	0.
224	0.	2271	0.	224	0.	2271	0.	301	301	0.	0.
226	0.	2291	0.	226	0.	2291	0.	4.99E-06	4.99E-06	0.	0.
228	0.	2311	0.	228	0.	2311	0.	301	301	0.	0.
230	0.	2331	0.	230	0.	2331	0.	4.99E-06	4.99E-06	0.	0.
232	0.	2351	0.	232	0.	2351	0.	301	301	0.	0.
234	0.	2371	0.	234	0.	2371	0.	4.99E-06	4.99E-06	0.	0.
236	0.	2391	0.	236	0.	2391	0.	301	301	0.	0.
238	0.	2411	0.	238	0.	2411	0.	4.99E-06	4.99E-06	0.	0.
240	0.	2431	0.	240	0.	2431	0.	301	301	0.	0.
242	0.	2451	0.	242	0.	2451	0.	4.99E-06	4.99E-06	0.	0.
244	0.	2471	0.	244	0.	2471	0.	301	301	0.	0.
246	0.	2491	0.	246	0.	2491	0.	4.99E-06	4.99E-06	0.	0.

## Appendix D

### Selected 30-sec Average Particle Distributions From the Flight of 5 April 1978

Thirty-sec averages are provided for a selected portion of the 5 April 1978 flight. During other times, activity was minimal.

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1712510

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.7E+07	26	0.	0.	5.57	
3	0.	47	0.	0.		
5	0.	67	0.	0.		
7	0.	131	0.	0.		
9	0.	148	0.	0.		
11	0.	169	0.	0.		
12	0.	189	0.	0.		
14	2.78E+05	209	0.	0.		
15	0.	231	0.	0.		
19	0.	253	0.	0.		
21	0.	271	0.	0.		
23	0.	291	0.	0.		
25	0.	311	0.	0.		
27	0.					
IMC	1.04E-06	1.	0.	0.		
4ED D	14					
TOTALS					0.	0.

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1712610

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.55E+07	26	0.	0.	437	
3	0.	47	0.	0.		
5	0.	67	0.	0.		
7	0.	131	0.	0.		
9	0.	148	0.	0.		
11	0.	169	0.	0.		
12	0.	189	0.	0.		
14	0.	209	0.	0.		
15	0.	231	0.	0.		
19	0.	253	0.	0.		
21	0.	271	0.	0.		
23	0.	291	0.	0.		
25	0.	311	0.	0.		
27	0.					
IMC	2.22E-07	0.	0.	0.		
4ED D	2					
TOTALS					0.	0.

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1712510

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.7E+07	26	0.	0.	5.56	
3	0.	47	0.	0.		
5	0.	67	0.	0.		
7	0.	131	0.	0.		
9	0.	148	0.	0.		
11	0.	169	0.	0.		
12	0.	189	0.	0.		
14	0.	209	0.	0.		
15	0.	231	0.	0.		
19	0.	253	0.	0.		
21	0.	271	0.	0.		
23	0.	291	0.	0.		
25	0.	311	0.	0.		
27	0.					
IMC	2.35E-07	0.	0.	0.		
4ED D	2					
TOTALS					0.	0.

AFWL CIRRUS STUDY BY AFGL  
FLIGHT E78-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1712610

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	3.08E+07	26	0.00E+04	0.	437	
3	0.	47	0.	0.		
5	0.	67	0.	0.		
7	0.	131	0.	0.		
9	0.	148	0.	0.		
11	0.	169	0.	0.		
12	0.	189	0.	0.		
14	0.	209	0.	0.		
15	0.	231	0.	0.		
19	0.	253	0.	0.		
21	0.	271	0.	0.		
23	0.	291	0.	0.		
25	0.	311	0.	0.		
27	0.					
IMC	2.68E-07	0.	0.02E-06	0.		
4ED D	2					
TOTALS					0.	0.

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 171210

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	3.3E+07	2.93E+04	437	5.61	
3	0.	47	706		
5	0.	67	1316		
7	0.	87	1316		
9	0.	108	1622		
11	0.	120	1927		
12	0.	148	2233		
14	0.	169	2539		
16	0.	189	2843		
18	0.	239	3149		
20	0.	230	3454		
22	0.	271	3760		
24	0.	291	4065		
26	0.	311	4370		
27	0.		4676		
TOTALS					
IMC	2.87E-07	3.73E-06	0.	3.73E-06	
4ED 0	2	22	0	22	

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 171200

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	3.27E+07	26	437	5.61	
3	0.	47	706		
5	0.	67	1011		
7	0.	87	1316		
9	0.	108	1622		
11	0.	128	1927		
12	0.	148	2233		
14	0.	169	2539		
16	0.	189	2843		
18	0.	209	3149		
20	0.	230	3454		
22	0.	250	3760		
24	0.	271	4065		
26	0.	291	4370		
27	0.	311	4676		
TOTALS					
IMC	2.85E-07	0.	0.	0.	
4ED 0	2	0	0	0	

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 171213

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	3.37E+07	26	437	5.61	
3	0.	47	706		
5	0.	67	1011		
7	0.	87	1316		
9	0.	108	1622		
11	0.	128	1927		
12	0.	148	2233		
14	0.	169	2539		
16	0.	189	2843		
18	0.	209	3149		
20	0.	230	3454		
22	0.	250	3760		
24	0.	271	4065		
26	0.	291	4370		
27	0.	311	4676		
TOTALS					
IMC	2.94E-07	0.	0.	0.	
4ED 0	2	0	0	0	

AFML CIRRUS STUDY BY AFGL  
 FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
 TYPE: BULL-ROSE INTERVAL START: 171203

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	3.24E+07	26	437	5.62	
3	0.	47	706		
5	0.	67	1011		
7	0.	87	1316		
9	0.	108	1622		
11	0.	128	1927		
12	0.	148	2233		
14	0.	169	2539		
16	0.	189	2843		
18	0.	209	3149		
20	0.	230	3454		
22	0.	250	3760		
24	0.	271	4065		
26	0.	291	4370		
27	0.	311	4676		
TOTALS					
IMC	2.62E-07	0.	0.	0.	
4ED 0	2	0	0	0	

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 171300

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 171290

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	T (°C)	FPT (°C)	TAS (M/S)
2	3.78E+07	26	0.	437	0.	7.6	0.
3	0.	47	0.	705	0.	1311	0.
4	0.	67	0.	1011	0.	1316	0.
5	0.	87	0.	1116	0.	1622	0.
7	0.	10A	0.	1222	0.	1927	0.
9	0.	128	0.	148	0.	2233	0.
11	0.	169	0.	2538	0.	2644	0.
12	0.	189	0.	3149	0.	3454	0.
14	0.	230	0.	3763	0.	4065	0.
15	0.	250	0.	4371	0.	4576	0.
16	0.	271	0.	0.	0.	0.	0.
18	0.	311	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.
23	0.	0.	0.	0.	0.	0.	0.
25	0.	0.	0.	0.	0.	0.	0.
27	0.	0.	0.	0.	0.	0.	0.
IMC	3.29E-07	0.	0.	0.	0.	0.	0.
4ED	0	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 171300

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 171290

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	PRECIP PROBE	ALT (KM)	T (°C)	FPT (°C)	TAS (M/S)
2	3.31E+07	26	0.	437	0.	7.6	0.
3	0.	47	0.	705	0.	1311	0.
4	0.	67	0.	1011	0.	1316	0.
5	0.	87	0.	1116	0.	1622	0.
7	0.	10A	0.	1222	0.	1927	0.
9	0.	128	0.	148	0.	2233	0.
11	0.	169	0.	2538	0.	2644	0.
12	0.	189	0.	3149	0.	3454	0.
14	0.	230	0.	3763	0.	4065	0.
15	0.	250	0.	4371	0.	4576	0.
16	0.	271	0.	0.	0.	0.	0.
18	0.	311	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.
23	0.	0.	0.	0.	0.	0.	0.
25	0.	0.	0.	0.	0.	0.	0.
27	0.	0.	0.	0.	0.	0.	0.
IMC	3.31E-07	0.	0.	0.	0.	0.	0.
4ED	0	0	0	0	0	0	0



AFML CIRRUS STUDY BY AFGL  
FLIGHT 278-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1713110

PARTICLE SIZE DISTRIBUTIONS (NUMBERS/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	4.06E+07	25	0.	437	5.63
3	0.	47	0.	706	0.
5	0.	67	0.	1011	-16.60C
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	-46.6C
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	TAS (M/S)
14	0.	169	0.	2538	154.02
15	0.	189	0.	2843	0.
17	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	FORM F0.00
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	NT(N/M**3)
27	0.	311	0.	4676	0.
TOTALS				0.	0.
INC	4.24E-07	0.	0.	0.	0.
4ED	2	0.	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 278-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1713113

PARTICLE SIZE DISTRIBUTIONS (NUMBERS/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	5.18E+07	26	2.79E+04	437	5.63
3	0.	47	0.	706	0.
5	0.	67	0.	1011	-16.60C
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	-46.6C
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	TAS (M/S)
14	0.	169	0.	2538	154.69
15	0.	189	0.	2843	0.
17	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	FORM F0.00
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	NT(N/M**3)
27	0.	311	0.	4676	0.
TOTALS				0.	0.
INC	5.38E-07	0.	0.	0.	0.
4ED	2	0.	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 278-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17132100

PARTICLE SIZE DISTRIBUTIONS (NUMBERS/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	5.02E+07	26	2.77E+04	437	5.63
3	0.	47	0.	706	0.
5	0.	67	0.	1011	-16.60C
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	-46.6C
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	TAS (M/S)
14	0.	169	0.	2538	155.62
15	0.	189	0.	2843	0.
17	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	FORM F0.00
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	NT(N/M**3)
27	0.	311	0.	4676	0.
TOTALS				0.	0.
INC	4.97E-07	0.	0.	0.	0.
4ED	2	0.	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 278-17 JN 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17132130

PARTICLE SIZE DISTRIBUTIONS (NUMBERS/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	5.20E+07	26	0.	437	5.63
3	0.	47	0.	706	0.
5	0.	67	0.	1011	-16.73C
7	0.	87	0.	1316	0.
9	0.	108	0.	1622	-46.7C
11	0.	128	0.	1927	0.
12	0.	148	0.	2233	TAS (M/S)
14	0.	169	0.	2538	155.77
15	0.	189	0.	2843	0.
17	0.	209	0.	3149	0.
19	0.	230	0.	3454	0.
21	0.	250	0.	3760	FORM F0.00
23	0.	271	0.	4065	0.
25	0.	291	0.	4370	NT(N/M**3)
27	0.	311	0.	4676	0.
TOTALS				0.	0.
INC	4.53E-07	0.	0.	0.	0.
4ED	2	0.	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17133100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	TOTALS
2	5.56E+07	26	0.	437	0.	0.
3	0.	47	0.	706	5.63	0.
5	0.	67	0.	1011	T -16.59C	0.
7	0.	87	0.	1316	FPT -46.7C	0.
9	0.	108	0.	1622	TAS (M/S)	0.
11	0.	128	0.	1927	156.01	0.
12	0.	148	0.	2233	Z 0.	0.
14	0.	169	0.	2538	FORM FL.00	0.
16	0.	189	0.	2843	NT(N/M**3)	0.
18	0.	209	0.	3149	0.	0.
20	0.	230	0.	3454		
21	0.	250	0.	3760		
23	0.	271	0.	4065		
25	0.	291	0.	4370		
27	0.	311	0.	4676		
IMC	4.05E-07	0.	0.	0.	0.	0.
MED	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17133100

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17133100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	TOTALS
2	7.42E+07	26	0.	437	0.	0.
3	0.	47	0.	706	5.63	0.
5	0.	67	0.	1011	T -16.59C	0.
7	0.	87	0.	1316	FPT -46.7C	0.
9	0.	108	0.	1622	TAS (M/S)	0.
11	0.	128	0.	1927	156.26	0.
12	0.	148	0.	2233	Z 0.	0.
14	0.	169	0.	2538	FORM FL.00	0.
16	0.	189	0.	2843	NT(N/M**3)	0.
18	0.	209	0.	3149	0.	0.
20	0.	230	0.	3454		
21	0.	250	0.	3760		
23	0.	271	0.	4065		
25	0.	291	0.	4370		
27	0.	311	0.	4676		
IMC	6.46E-07	0.	0.	0.	0.	0.
MED	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17133100

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17133100

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17134100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	TOTALS
2	7.19E+07	26	0.	437	0.	0.
3	0.	47	0.	706	5.63	0.
5	0.	67	0.	1011	T -16.59C	0.
7	0.	87	0.	1316	FPT -46.7C	0.
9	0.	108	0.	1622	TAS (M/S)	0.
11	0.	128	0.	1927	155.52	0.
12	0.	148	0.	2233	Z 0.	0.
14	0.	169	0.	2538	FORM FL.00	0.
16	0.	189	0.	2843	NT(N/M**3)	0.
18	0.	209	0.	3149	0.	0.
20	0.	230	0.	3454		
21	0.	250	0.	3760		
23	0.	271	0.	4065		
25	0.	291	0.	4370		
27	0.	311	0.	4676		
IMC	6.53E-07	0.	0.	0.	0.	0.
MED	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17134100

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17134100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	TOTALS
2	7.07E+07	26	0.	437	0.	0.
3	0.	47	0.	706	5.63	0.
5	0.	67	0.	1011	T -16.61C	0.
7	0.	87	0.	1316	FPT -46.7C	0.
9	0.	108	0.	1622	TAS (M/S)	0.
11	0.	128	0.	1927	154.58	0.
12	0.	148	0.	2233	Z 0.	0.
14	0.	169	0.	2538	FORM FL.00	0.
16	0.	189	0.	2843	NT(N/M**3)	0.
18	0.	209	0.	3149	0.	0.
20	0.	230	0.	3454		
21	0.	250	0.	3760		
23	0.	271	0.	4065		
25	0.	291	0.	4370		
27	0.	311	0.	4676		
IMC	5.86E-07	0.	0.	0.	0.	0.
MED	0	0	0	0	0	0

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17134100

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 17134100

AFML CIRRUS STUDY BY AFGL  
FLIGHT 78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1812100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	PRECIP PROBE
2	3.22E+09	26	0.	437	0.	280.96	0.
3	3.18E+07	47	0.	706	0.	9.63	0.
5	0.	1311	0.	1316	0.	1	-49.58C
7	0.	87	0.	1316	0.	FPT	-49.4C
9	0.	108	0.	1622	0.	TAS (M/S)	123.71
11	0.	128	0.	1927	0.	Z	0.
12	0.	148	0.	2233	0.	FORM	F0.00
14	0.	169	0.	2538	0.	NT(N/M**3)	0.
16	0.	189	0.	2843	0.		
18	0.	209	0.	3149	0.		
19	0.	230	0.	3454	0.		
21	0.	250	0.	3763	0.		
23	0.	271	0.	4065	0.		
25	0.	291	0.	4374	0.		
27	0.	311	0.	4676	0.		
TOTALS							
INC	3.31E-05	0.	0.	0.	0.		
4ED	0.	0.	0.	0.	0.		

AFML CIRRUS STUDY BY AFGL  
FLIGHT 78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1812100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	PRECIP PROBE
2	3.22E+09	26	0.	437	0.	280.96	0.
3	3.18E+07	47	0.	706	0.	9.63	0.
5	0.	1311	0.	1316	0.	1	-49.58C
7	0.	87	0.	1316	0.	FPT	-49.4C
9	0.	108	0.	1622	0.	TAS (M/S)	123.71
11	0.	128	0.	1927	0.	Z	0.
12	0.	148	0.	2233	0.	FORM	F0.00
14	0.	169	0.	2538	0.	NT(N/M**3)	0.
16	0.	189	0.	2843	0.		
18	0.	209	0.	3149	0.		
19	0.	230	0.	3454	0.		
21	0.	250	0.	3763	0.		
23	0.	271	0.	4065	0.		
25	0.	291	0.	4374	0.		
27	0.	311	0.	4676	0.		
TOTALS							
INC	3.31E-05	0.	0.	0.	0.		
4ED	0.	0.	0.	0.	0.		

AFML CIRRUS STUDY BY AFGL  
FLIGHT 78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1812100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	PRECIP PROBE
2	3.22E+09	26	0.	437	0.	280.96	0.
3	3.18E+07	47	0.	706	0.	9.63	0.
5	0.	1311	0.	1316	0.	1	-49.58C
7	0.	87	0.	1316	0.	FPT	-49.4C
9	0.	108	0.	1622	0.	TAS (M/S)	123.71
11	0.	128	0.	1927	0.	Z	0.
12	0.	148	0.	2233	0.	FORM	F0.00
14	0.	169	0.	2538	0.	NT(N/M**3)	0.
16	0.	189	0.	2843	0.		
18	0.	209	0.	3149	0.		
19	0.	230	0.	3454	0.		
21	0.	250	0.	3763	0.		
23	0.	271	0.	4065	0.		
25	0.	291	0.	4374	0.		
27	0.	311	0.	4676	0.		
TOTALS							
INC	3.31E-05	0.	0.	0.	0.		
4ED	0.	0.	0.	0.	0.		

AFML CIRRUS STUDY BY AFGL  
FLIGHT 78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1812100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	PRECIP PROBE
2	3.22E+09	26	0.	437	0.	280.96	0.
3	3.18E+07	47	0.	706	0.	9.63	0.
5	0.	1311	0.	1316	0.	1	-49.58C
7	0.	87	0.	1316	0.	FPT	-49.4C
9	0.	108	0.	1622	0.	TAS (M/S)	123.71
11	0.	128	0.	1927	0.	Z	0.
12	0.	148	0.	2233	0.	FORM	F0.00
14	0.	169	0.	2538	0.	NT(N/M**3)	0.
16	0.	189	0.	2843	0.		
18	0.	209	0.	3149	0.		
19	0.	230	0.	3454	0.		
21	0.	250	0.	3763	0.		
23	0.	271	0.	4065	0.		
25	0.	291	0.	4374	0.		
27	0.	311	0.	4676	0.		
TOTALS							
INC	3.31E-05	0.	0.	0.	0.		
4ED	0.	0.	0.	0.	0.		

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18123100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	280.79
2	3.30E+09	26	0.	437	0.	9.60
3	9.89E+07	47	0.	706	0.	0.
5	0.	67	0.	1011	0.	T -49.60C
7	0.	87	0.	1316	0.	FPT -49.40C
9	0.	108	0.	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	125.75
12	0.	148	0.	2233	0.	0.
14	0.	169	0.	2538	0.	Z 0.
16	0.	189	0.	2843	0.	FORN F0.00
18	0.	209	0.	3149	0.	MT(N/M**3)
19	0.	230	0.	3454	0.	0.
21	0.	250	0.	3760	0.	TOTALS
23	0.	271	0.	4065	0.	0.
25	0.	291	0.	4370	0.	0.
27	0.	311	0.	4676	0.	0.
IMC	3.41E-05	0.	0.	0.	0.	0.
4ED 0	2	0.	0.	0.	0.	0.

92

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18123100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	280.61
2	3.32E+09	26	0.	437	0.	9.60
3	3.86E+07	47	0.	706	0.	0.
5	0.	67	0.	1011	0.	T -49.61C
7	0.	87	0.	1316	0.	FPT -49.40C
9	0.	108	0.	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	126.44
12	0.	148	0.	2233	0.	0.
14	0.	169	0.	2538	0.	Z 0.
16	0.	189	0.	2843	0.	FORN F0.00
18	0.	209	0.	3149	0.	MT(N/M**3)
19	0.	230	0.	3454	0.	0.
21	0.	250	0.	3760	0.	TOTALS
23	0.	271	0.	4065	0.	0.
25	0.	291	0.	4370	0.	0.
27	0.	311	0.	4676	0.	0.
IMC	3.43E-05	0.	0.	0.	0.	0.
4ED 0	2	0.	0.	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18124100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	280.51
2	3.28E+09	26	0.	437	0.	9.61
3	1.04E+08	47	0.	706	0.	0.
5	0.	67	0.	1011	0.	T -49.65C
7	0.	87	0.	1316	0.	FPT -49.40C
9	0.	108	0.	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	127.89
12	0.	148	0.	2233	0.	0.
14	0.	169	0.	2538	0.	Z 2.84E-04
16	0.	189	0.	2843	0.	FORN F 0.91
18	0.	209	0.	3149	0.	MT(N/M**3)
19	0.	230	0.	3454	0.	0.
21	0.	250	0.	3760	0.	TOTALS
23	0.	271	0.	4065	0.	0.
25	0.	291	0.	4370	0.	0.
27	0.	311	0.	4676	0.	0.
IMC	3.43E-05	0.	0.	0.	0.	0.
4ED 0	2	0.	0.	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18124100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	280.33
2	3.32E+09	26	0.	437	0.	9.61
3	1.11E+08	47	0.	706	0.	0.
5	0.	67	0.	1011	0.	T -49.68C
7	0.	87	0.	1316	0.	FPT -49.40C
9	0.	108	0.	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	127.59
12	0.	148	0.	2233	0.	0.
14	0.	169	0.	2538	0.	Z 0.
16	0.	189	0.	2843	0.	FORN F0.00
18	0.	209	0.	3149	0.	MT(N/M**3)
19	0.	230	0.	3454	0.	0.
21	0.	250	0.	3760	0.	TOTALS
23	0.	271	0.	4065	0.	0.
25	0.	291	0.	4370	0.	0.
27	0.	311	0.	4676	0.	0.
IMC	3.50E-05	0.	0.	0.	0.	0.
4ED 0	2	0.	0.	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18125159

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (MU)	ALT (KM)	TOTALS
2	3.11E+09	26	0.	437	9.61	0.
3	1.14E+08	47	0.	706	7	0.
4	0.	67	0.	1011	T -49.67C	0.
5	0.	87	0.	1316	FPT -49.4C	0.
6	0.	108	0.	1622	TAS (M/S)	0.
7	0.	128	0.	1927	120.44	0.
8	0.	148	0.	2233	20.	0.
9	0.	169	0.	2538	FORM F6.00	0.
10	0.	189	0.	2843	MT (M/M**3)	0.
11	0.	209	0.	3149	0.	0.
12	0.	230	0.	3454		0.
13	0.	250	0.	3760		0.
14	0.	271	0.	4065		0.
15	0.	291	0.	4370		0.
16	0.	311	0.	4676		0.
17	0.					0.
18	0.					0.
19	0.					0.
20	0.					0.
21	0.					0.
22	0.					0.
23	0.					0.
24	0.					0.
25	0.					0.
26	0.					0.
27	0.					0.
28	0.					0.
29	0.					0.
30	0.					0.
31	0.					0.
32	0.					0.
33	0.					0.
34	0.					0.
35	0.					0.
36	0.					0.
37	0.					0.
38	0.					0.
39	0.					0.
40	0.					0.
41	0.					0.
42	0.					0.
43	0.					0.
44	0.					0.
45	0.					0.
46	0.					0.
47	0.					0.
48	0.					0.
49	0.					0.
50	0.					0.
51	0.					0.
52	0.					0.
53	0.					0.
54	0.					0.
55	0.					0.
56	0.					0.
57	0.					0.
58	0.					0.
59	0.					0.
60	0.					0.
61	0.					0.
62	0.					0.
63	0.					0.
64	0.					0.
65	0.					0.
66	0.					0.
67	0.					0.
68	0.					0.
69	0.					0.
70	0.					0.
71	0.					0.
72	0.					0.
73	0.					0.
74	0.					0.
75	0.					0.
76	0.					0.
77	0.					0.
78	0.					0.
79	0.					0.
80	0.					0.
81	0.					0.
82	0.					0.
83	0.					0.
84	0.					0.
85	0.					0.
86	0.					0.
87	0.					0.
88	0.					0.
89	0.					0.
90	0.					0.
91	0.					0.
92	0.					0.
93	0.					0.
94	0.					0.
95	0.					0.
96	0.					0.
97	0.					0.
98	0.					0.
99	0.					0.
100	0.					0.
101	0.					0.
102	0.					0.
103	0.					0.
104	0.					0.
105	0.					0.
106	0.					0.
107	0.					0.
108	0.					0.
109	0.					0.
110	0.					0.
111	0.					0.
112	0.					0.
113	0.					0.
114	0.					0.
115	0.					0.
116	0.					0.
117	0.					0.
118	0.					0.
119	0.					0.
120	0.					0.
121	0.					0.
122	0.					0.
123	0.					0.
124	0.					0.
125	0.					0.
126	0.					0.
127	0.					0.
128	0.					0.
129	0.					0.
130	0.					0.
131	0.					0.
132	0.					0.
133	0.					0.
134	0.					0.
135	0.					0.
136	0.					0.
137	0.					0.
138	0.					0.
139	0.					0.
140	0.					0.
141	0.					0.
142	0.					0.
143	0.					0.
144	0.					0.
145	0.					0.
146	0.					0.
147	0.					0.
148	0.					0.
149	0.					0.
150	0.					0.
151	0.					0.
152	0.					0.
153	0.					0.
154	0.					0.
155	0.					0.
156	0.					0.
157	0.					0.
158	0.					0.
159	0.					0.
160	0.					0.
161	0.					0.
162	0.					0.
163	0.					0.
164	0.					0.
165	0.					0.
166	0.					0.
167	0.					0.
168	0.					0.
169	0.					0.
170	0.					0.
171	0.					0.
172	0.					0.
173	0.					0.
174	0.					0.
175	0.					0.
176	0.					0.
177	0.					0.
178	0.					0.
179	0.					0.
180	0.					0.
181	0.					0.
182	0.					0.
183	0.					0.
184	0.					0.
185	0.					0.
186	0.					0.
187	0.					0.
188	0.					0.
189	0.					0.
190	0.					0.
191	0.					0.
192	0.					0.
193	0.					0.
194	0.					0.
195	0.					0.
196	0.					0.
197	0.					0.
198	0.					0.
199	0.					0.
200	0.					0.
201	0.					0.
202	0.					0.
203	0.					0.
204	0.					0.
205	0.					0.
206	0.					0.
207	0.					0.
208	0.					0.
209	0.					0.
210	0.					0.
211	0.					0.
212	0.					0.
213	0.					0.
214	0.					0.
215	0.					0.
216	0.					0.
217	0.					0.
218	0.					0.
219	0.					0.
220	0.					0.
221	0.					0.
222	0.					0.
223	0.					0.
224	0.					0.
225	0.					0.
226	0.					0.
227	0.					0.
228	0.					0.
229	0.					0.
230	0.					0.
231	0.					0.
232	0.					0.
233	0.					0.
234	0.					0.
235	0.					0.
236	0.					0.
237	0.					0.
238	0.					0.
239	0.					0.
240	0.					0.
241	0.					0.
242	0.					0.
243	0.					0.
244	0.					0.
245	0.					0.
246	0.					0.
247	0.					0.
248	0.					0.
249	0.					0.
250	0.					0.
251	0.					0.
252	0.					0.
253	0.					0.
254	0.					0.
255	0.					0.
256	0.					0.
257	0.					0.
258	0.					0.
259	0.					0.
260	0.					0.
261	0.					0.
262	0.					0.
263	0.					0.
264	0.					0.
265	0.					0.
266	0.					0.
267	0.					0.
268	0.					0.
269	0.					0.
270	0.					0.
271	0.					0.
272	0.					0.
273	0.					0.
274	0.					0.
275	0.					0.
276	0.					0.
277	0.					0.
278	0.					0.
279	0.					0.
280	0.					0.
281	0.					0.
282	0.					0.
283	0.					0.
284	0.					0.
285	0.					0.
286	0.					0.
287						

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 18122159

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 18122159

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	T (°C)	FPT (H/S)
2	3.37E+09	26	0.	437	9.63		
3	1.18E+08	47	0.	706			
5	0.	67	0.	1011			
7	0.	87	0.	1316			
9	0.	108	0.	1622			
11	0.	128	0.	1927			
12	0.	148	0.	2233			
14	0.	169	0.	2538			
16	0.	189	0.	2843			
18	0.	209	0.	3149			
19	0.	230	0.	3454			
21	0.	250	0.	3760			
23	0.	271	0.	4065			
25	0.	291	0.	4370			
27	0.	311	0.	4676			
TOTALS				ALT	T	FPT	TAS
INC	3.59E-05	0.	0.	0.	-49.31C	-49.4C	134.47
MED	2	0.	0.	0.			2 0.
							FORM F0.00
							MT(N/M**3)
							0.

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	T (°C)	FPT (H/S)
2	3.40E-05	26	0.	437	9.64		
3	1.11E+08	47	0.	706			
5	0.	67	0.	1011			
7	0.	87	0.	1316			
9	0.	108	0.	1622			
11	0.	128	0.	1927			
12	0.	148	0.	2233			
14	0.	169	0.	2538			
16	0.	189	0.	2843			
18	0.	209	0.	3149			
19	0.	230	0.	3454			
21	0.	250	0.	3760			
23	0.	271	0.	4065			
25	0.	291	0.	4370			
27	0.	311	0.	4676			
TOTALS				ALT	T	FPT	TAS
INC	3.40E-05	0.	0.	0.	-49.31C	-49.4C	134.47
MED	2	0.	0.	0.			2 0.
							FORM F0.00
							MT(N/M**3)
							0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 18122129

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 18122129

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	T (°C)	FPT (H/S)
2	3.32E+09	26	0.	437	9.64		
3	1.13E+08	47	0.	706			
5	0.	67	0.	1011			
7	0.	87	0.	1316			
9	0.	108	0.	1622			
11	0.	128	0.	1927			
12	0.	148	0.	2233			
14	0.	169	0.	2538			
16	0.	189	0.	2843			
18	0.	209	0.	3149			
19	0.	230	0.	3454			
21	0.	250	0.	3760			
23	0.	271	0.	4065			
25	0.	291	0.	4370			
27	0.	311	0.	4676			
TOTALS				ALT	T	FPT	TAS
INC	3.52E-05	0.	0.	0.	-49.31C	-49.4C	135.25
MED	2	0.	0.	0.			2 0.
							FORM F0.00
							MT(N/M**3)
							0.

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	T (°C)	FPT (H/S)
2	3.40E-05	26	0.	437	9.63		
3	1.16E+08	47	0.	706			
5	0.	67	0.	1011			
7	0.	87	0.	1316			
9	0.	108	0.	1622			
11	0.	128	0.	1927			
12	0.	148	0.	2233			
14	0.	169	0.	2538			
16	0.	189	0.	2843			
18	0.	209	0.	3149			
19	0.	230	0.	3454			
21	0.	250	0.	3760			
23	0.	271	0.	4065			
25	0.	291	0.	4370			
27	0.	311	0.	4676			
TOTALS				ALT	T	FPT	TAS
INC	3.35E-05	0.	0.	0.	-49.31C	-49.4C	135.25
MED	2	0.	0.	0.			2 0.
							FORM F0.00
							MT(N/M**3)
							0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 18128159

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (μM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (μM)	ALT (KM)	
2	3.14E+09	26	0.	437	9.63	
3	1.14E+08	47	0.	706		
5	0.	67	0.	1011		
7	0.	07	0.	1316		
9	0.	108	0.	1622		
11	0.	128	0.	1927		
12	0.	148	0.	2233		
14	0.	169	0.	2538		
16	0.	189	0.	2843		
19	0.	209	0.	3149		
21	0.	230	0.	3454		
23	0.	251	0.	3760		
25	0.	271	0.	4065		
27	0.	291	0.	4370		
		311	0.	4676		
TOTALS						
INC	3.39E-05	0.	0.	0.		
4E0 0	2	0	0	0		

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 18129183

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (μM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (μM)	ALT (KM)	
2	3.15E+09	26	0.	437	9.65	
3	1.14E+08	47	0.	706		
5	0.	67	0.	1011		
7	0.	07	0.	1316		
9	0.	108	0.	1622		
11	0.	128	0.	1927		
12	0.	148	0.	2233		
14	0.	169	0.	2538		
16	0.	189	0.	2843		
19	0.	209	0.	3149		
21	0.	230	0.	3454		
23	0.	251	0.	3760		
25	0.	271	0.	4065		
27	0.	291	0.	4370		
		311	0.	4676		
TOTALS						
INC	3.36E-05	0.	0.	0.		
4E0 0	2	0	0	0		

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 18129129

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (μM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (μM)	ALT (KM)	
2	7.14E+09	26	0.	437	9.64	
3	1.06E+08	47	0.	706		
5	0.	67	0.	1011		
7	0.	07	0.	1316		
9	0.	108	0.	1622		
11	0.	128	0.	1927		
12	0.	148	0.	2233		
14	0.	169	0.	2538		
16	0.	189	0.	2843		
19	0.	209	0.	3149		
21	0.	230	0.	3454		
23	0.	251	0.	3760		
25	0.	271	0.	4065		
27	0.	291	0.	4370		
		311	0.	4676		
TOTALS						
INC	3.32E-05	0.	0.	0.		
4E0 0	2	0	0	0		

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 18130123

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (μM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	SIZE (μM)	ALT (KM)	
2	3.15E+09	26	0.	437	9.65	
3	1.12E+08	47	0.	706		
5	0.	67	0.	1011		
7	0.	07	0.	1316		
9	0.	108	0.	1622		
11	0.	128	0.	1927		
12	0.	148	0.	2233		
14	0.	169	0.	2538		
16	0.	189	0.	2843		
19	0.	209	0.	3149		
21	0.	230	0.	3454		
23	0.	251	0.	3760		
25	0.	271	0.	4065		
27	0.	291	0.	4370		
		311	0.	4676		
TOTALS						
INC	3.30E-05	0.	0.	0.		
4E0 0	2	0	0	0		

APWL CIRBUS STUDY BY AFGL  
FLIGHT E70-17 ON 5 APR 70 30 SECOND AVERAGING  
TYPE1 BULL-ROSE INTERVAL START: 10130159

[illegible]

TOTALS							
J.	0.	0.	IMC	3.58E-05	0.	5.17E-07	5.17E-07
IMC	3.29E-05	0.	0.	0.	0.	0.	0.

NEWL CIRRUS STUDY BY AFGL  
FLIGHT E/O-17 JW 5 APR 78 30 SECOND AVERAGING  
TYPE: NULL-ROSE INTERVAL START: 101321Z

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)			
SIZE (MM)	SCATTER	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	PRECIP PROBE	PRESS (MB)
2	2.98E+04	26	0.	0.	ALT	9.66	278.26
3	1.15E+06	47	0.	0.			
5	0.	67	0.	0.	T	-49.44C	
7	0.	1316	0.	0.			
9	2.48E+05	1822	0.	0.	PPT	-49.4C	
11	0.	1927	0.	0.			
12	0.	2233	0.	0.	TAS	135.37	
14	0.	2330	0.	0.			
15	0.	2843	0.	0.	Z	B.	
16	0.	2857	0.	0.			
18	1	3149	0.	0.			
19	0.	3254	0.	0.			
21	0.	3760	0.	0.	FOR4	F6.00	
23	0.	4865	0.	0.			
25	0.	4370	0.	0.	MTIN/M+0.3		
27	0.	4676	0.	0.	N.		
29	0.	4676	0.	0.			
31	0.	4676	0.	0.			
33	0.	4676	0.	0.			
35	0.	4676	0.	0.			
37	0.	4676	0.	0.			
39	0.	4676	0.	0.			
41	0.	4676	0.	0.			
43	0.	4676	0.	0.			
45	0.	4676	0.	0.			
47	0.	4676	0.	0.			
49	0.	4676	0.	0.			
51	0.	4676	0.	0.			
53	0.	4676	0.	0.			
55	0.	4676	0.	0.			
57	0.	4676	0.	0.			
59	0.	4676	0.	0.			
61	0.	4676	0.	0.			
63	0.	4676	0.	0.			
65	0.	4676	0.	0.			
67	0.	4676	0.	0.			
69	0.	4676	0.	0.			
71	0.	4676	0.	0.			
73	0.	4676	0.	0.			
75	0.	4676	0.	0.			
77	0.	4676	0.	0.			
79	0.	4676	0.	0.			
81	0.	4676	0.	0.			
83	0.	4676	0.	0.			
85	0.	4676	0.	0.			
87	0.	4676	0.	0.			
89	0.	4676	0.	0.			
91	0.	4676	0.	0.			
93	0.	4676	0.	0.			
95	0.	4676	0.	0.			
97	0.	4676	0.	0.			
99	0.	4676	0.	0.			
101	0.	4676	0.	0.			
103	0.	4676	0.	0.			
105	0.	4676	0.	0.			
107	0.	4676	0.	0.			
109	0.	4676	0.	0.			
111	0.	4676	0.	0.			
113	0.	4676	0.	0.			
115	0.	4676	0.	0.			
117	0.	4676	0.	0.			
119	0.	4676	0.	0.			
121	0.	4676	0.	0.			
123	0.	4676	0.	0.			
125	0.	4676	0.	0.			
127	0.	4676	0.	0.			
129	0.	4676	0.	0.			
131	0.	4676	0.	0.			
133	0.	4676	0.	0.			
135	0.	4676	0.	0.			
137	0.	4676	0.	0.			
139	0.	4676	0.	0.			
141	0.	4676	0.	0.			
143	0.	4676	0.	0.			
145	0.	4676	0.	0.			
147	0.	4676	0.	0.			
149	0.	4676	0.	0.			
151	0.	4676	0.	0.			
153	0.	4676	0.	0.			
155	0.	4676	0.	0.			
157	0.	4676	0.	0.			
159	0.	4676	0.	0.			
161	0.	4676	0.	0.			
163	0.	4676	0.	0.			
165	0.	4676	0.	0.			
167	0.	4676	0.	0.			
169	0.	4676	0.	0.			
171	0.	4676	0.	0.			
173	0.	4676	0.	0.			
175	0.	4676	0.	0.			
177	0.	4676	0.	0.			
179	0.	4676	0.	0.			
181	0.	4676	0.	0.			
183	0.	4676	0.	0.			
185	0.	4676	0.	0.			
187	0.	4676	0.	0.			
189	0.	4676	0.	0.			
191	0.	4676	0.	0.			
193	0.	4676	0.	0.			
195	0.	4676	0.	0.			
197	0.	4676	0.	0.			
199	0.	4676	0.	0.			
201	0.	4676	0.	0.			
203	0.	4676	0.	0.			
205	0.	4676	0.	0.			
207	0.	4676	0.	0.			
209	0.	4676	0.	0.			
211	0.	4676	0.	0.			
213	0.	4676	0.	0.			
215	0.	4676	0.	0.			
217	0.	4676	0.	0.			
219	0.	4676	0.	0.			
221	0.	4676	0.	0.			
223	0.	4676	0.	0.			
225	0.	4676	0.	0.			
227	0.	4676	0.	0.			
229	0.	4676	0.	0.			
231	0.	4676	0.	0.			
233	0.	4676	0.	0.			
235	0.	4676	0.	0.			
237	0.	4676	0.	0.			
239	0.	4676	0.	0.			
241	0.	4676	0.	0.			
243	0.	4676	0.	0.			
245	0.	4676	0.	0.			
247	0.	4676	0.	0.			
249	0.	4676	0.	0.			
251	0.	4676	0.	0.			
253	0.	4676	0.	0.			
255	0.	4676	0.	0.			
257	0.	4676	0.	0.			
259	0.	4676	0.	0.			
261	0.	4676	0.	0.			
263	0.	4676	0.	0.			
265	0.	4676	0.	0.			
267	0.	4676	0.	0.			
269	0.	4676	0.	0.			
271	0.	4676	0.	0.			
273	0.	4676	0.	0.			
275	0.	4676	0.	0.			
277	0.	4676	0.	0.			
279	0.	4676	0.	0.			
281	0.	4676	0.	0.			
283	0.	4676	0.	0.			
285	0.	4676	0.	0.			
287	0.	4676	0.	0.			
289	0.	4676	0.	0.			
291	0.	4676	0.	0.			
293	0.	4676	0.	0.			
295	0.	4676	0.	0.			
297	0.	4676	0.	0.			
299	0.	4676	0.	0.			
301	0.	4676	0.	0.			
303	0.	4676	0.	0.			
305	0.	4676	0.	0.			
307	0.	4676	0.	0.			
309	0.	4676	0.	0.			
311	0.	4676	0.	0.			
313	0.	4676	0.	0.			
315	0.	4676	0.	0.			
317	0.	4676	0.	0.			
319	0.	4676	0.	0.			
321	0.	4676	0.	0.			
323	0.	4676	0.	0.			
325	0.	4676	0.	0.			
327	0.	4676	0.	0.			
329	0.	4676	0.	0.			
331	0.	4676	0.	0.			
333	0.	4676	0.	0.			
335	0.	4676	0.	0.			
337	0.	4676	0.	0.			
339	0.	4676	0.	0.			
341	0.	4676	0.	0.			
343	0.	4676	0.	0.			
345	0.	4676	0.	0.			
347	0.	4676	0.	0.			
349	0.	4676	0.	0.			
351	0.	4676	0.	0.			
353	0.	4676	0.	0.			
355	0.	4676	0.	0.			
357	0.	4676	0.	0.			
359	0.	4676	0.	0.			
361	0.	4676	0.	0.			
363	0.	4676	0.	0.			
365	0.	4676	0.	0.			
367	0.	4676	0.	0.			
369	0.	4676	0.	0.			
371	0.	4676	0.	0.			
373	0.	4676	0.	0.			
375	0.	4676	0.	0.			
377	0.	4676	0.	0.			
379	0.	4676	0.	0.			
381	0.	4676	0.	0.			
383	0.	4676	0.	0.			
385	0.	4676	0.	0.			
387	0.	4676	0.	0.			
389	0.	4676	0.	0.			
391	0.	4676	0.	0.			
393	0.	4676	0.	0.			
395	0.	4676	0.	0.			
397	0.	4676	0.	0.			
399	0.	4676	0.	0.			
401	0.	4676	0.	0.			
403	0.	4676	0.	0.			
405	0.	4676	0.	0.			
407	0.	4676	0.	0.			
409	0.	4676	0.	0.			
411	0.	4676	0.	0.			
413	0.	4676	0.	0.			
415	0.	4676	0.	0.			
417	0.	4676	0.	0.			
419	0.	4676	0.	0.			
421	0.	4676	0.	0.			
423	0.	4676	0.	0.			
425	0.	4676	0.	0.			
427	0.	4676	0.	0.			
429	0.	4676	0.	0.			
431	0.	4676	0.	0.			
433	0.	4676	0.	0.			
435	0.	4676	0.	0.			
437	0.	4676	0.	0.			
439	0.	4676	0.	0.			
441	0.	4676	0.	0.			
443	0.	4676	0.	0.			
445	0.	4676	0.	0.			
447	0.	4676	0.	0.			
449	0.	4676	0.	0.			
451	0.	4676	0.	0.			
453	0.	4676	0.	0.			
455	0.	4676	0.	0.			
457	0.	4676	0.	0.			
459	0.	4676	0.	0.			
461	0.	4676	0.	0.			
463	0.	4676	0.	0.			
465	0.	4676	0.	0.			
467	0.	4676	0.	0.			
469	0.	4676	0.	0.			
471	0.	4676	0.	0.			
473	0.	4676	0.	0.			
475	0.	4676	0.	0.			
477	0.						

[illegible]



AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18133800

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	2.95E+09	26	437	9.66	278.32
3	1.24E+08	47	706	9.66	278.32
5	0.	67	1011	9.66	278.32
7	0.	87	1316	9.66	278.32
9	0.	108	1622	9.66	278.32
11	0.	128	1927	9.66	278.32
12	0.	148	2233	9.66	278.32
14	0.	169	2538	9.66	278.32
16	0.	189	2843	9.66	278.32
18	0.	209	3149	9.66	278.32
20	0.	230	3454	9.66	278.32
22	0.	250	3760	9.66	278.32
24	0.	271	4065	9.66	278.32
26	0.	291	4370	9.66	278.32
27	0.	311	4676	9.66	278.32
TOTALS				9.66	278.32
INC	3.45E-05	0.	7.74E-07	0.	0.
4ED D	2	191	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18133800

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	2.95E+09	26	437	9.66	278.32
3	1.24E+08	47	706	9.66	278.32
5	0.	67	1011	9.66	278.32
7	0.	87	1316	9.66	278.32
9	0.	108	1622	9.66	278.32
11	0.	128	1927	9.66	278.32
12	0.	148	2233	9.66	278.32
14	0.	169	2538	9.66	278.32
16	0.	189	2843	9.66	278.32
18	0.	209	3149	9.66	278.32
20	0.	230	3454	9.66	278.32
22	0.	250	3760	9.66	278.32
24	0.	271	4065	9.66	278.32
26	0.	291	4370	9.66	278.32
27	0.	311	4676	9.66	278.32
TOTALS				9.66	278.32
INC	3.45E-05	0.	7.74E-07	0.	0.
4ED D	2	191	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18134100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	2.74E+09	26	437	9.66	278.35
3	1.24E+08	47	706	9.66	278.35
5	0.	67	1011	9.66	278.35
7	0.	87	1316	9.66	278.35
9	0.	108	1622	9.66	278.35
11	0.	128	1927	9.66	278.35
12	0.	148	2233	9.66	278.35
14	0.	169	2538	9.66	278.35
16	0.	189	2843	9.66	278.35
18	0.	209	3149	9.66	278.35
20	0.	230	3454	9.66	278.35
22	0.	250	3760	9.66	278.35
24	0.	271	4065	9.66	278.35
26	0.	291	4370	9.66	278.35
27	0.	311	4676	9.66	278.35
TOTALS				9.66	278.35
INC	3.46E-05	0.	7.74E-07	0.	0.
4ED D	2	191	0.	0.	0.

AFML CIRRUS STUDY BY AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18134100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	ALT (KM)	ALT (KM)
2	2.77E+09	26	437	9.66	278.31
3	1.24E+08	47	706	9.66	278.31
5	0.	67	1011	9.66	278.31
7	0.	87	1316	9.66	278.31
9	0.	108	1622	9.66	278.31
11	0.	128	1927	9.66	278.31
12	0.	148	2233	9.66	278.31
14	0.	169	2538	9.66	278.31
16	0.	189	2843	9.66	278.31
18	0.	209	3149	9.66	278.31
20	0.	230	3454	9.66	278.31
22	0.	250	3760	9.66	278.31
24	0.	271	4065	9.66	278.31
26	0.	291	4370	9.66	278.31
27	0.	311	4676	9.66	278.31
TOTALS				9.66	278.31
INC	3.09E-05	0.	1.53E-06	0.	0.
4ED D	2	191	0.	0.	0.

AFNL CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18135100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	ALT (KM)
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	278.21	9.66
2	2.61E+09	26 0.	437 5.97E-01		
3	1.21E+08	47 0.	706 0.		
5	0.	67 0.	1011 0.	T -49.94C	
7	0.	87 0.	1316 0.		
9	0.	106 0.	1622 0.	FPT -49.4C	
11	0.	126 0.	1927 0.		
12	0.	146 0.	2233 0.	TAS (M/S)	
14	0.	169 0.	2538 0.	138.07	
16	0.	189 0.	2843 0.		
18	0.	209 0.	3149 0.	2 6.87E-06	
19	0.	230 0.	3454 0.		
21	0.	250 0.	3760 0.	FORM F1.00	
23	0.	271 0.	4065 0.	NT(N/M <sup>3</sup> )	
25	0.	291 0.	4370 0.	2.3832E-01	
27	0.	311 0.	4676 0.		
IMC	2.94E-05	0.	5.10E-07	TOTALS	
4ED 9	2	0	191	5.10E-07	191

IMC 2.94E-05 0. 5.10E-07 191  
4ED 9 2 0 191

AFNL CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18135130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	ALT (KM)
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	278.02	9.67
2	2.60E+09	26 0.	437 0.		
3	1.33E+08	47 0.	706 0.		
5	0.	67 0.	1011 0.	T -49.88C	
7	0.	87 0.	1316 0.		
9	0.	106 0.	1622 0.	FPT -49.4C	
11	0.	126 0.	1927 0.		
12	0.	146 0.	2233 0.	TAS (M/S)	
14	0.	169 0.	2538 0.	138.30	
16	0.	189 0.	2843 0.		
18	0.	209 0.	3149 0.	2 0.	
19	0.	230 0.	3454 0.		
21	0.	250 0.	3760 0.	FORM F0.00	
23	0.	271 0.	4065 0.	NT(N/M <sup>3</sup> )	
25	0.	291 0.	4370 0.	0.	
27	0.	311 0.	4676 0.		
IMC	3.00E-05	0.	0.	TOTALS	
4ED 0	2	0	0	0.	0

IMC 3.00E-05 0. 0. 0  
4ED 0 2 0 0

AFNL CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18135100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	ALT (KM)
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	278.02	9.67
2	2.53E+09	26 1.	437 1.19E+00		
3	1.39E+08	47 0.	706 0.		
5	2.44E+05	67 0.	1011 0.	T -49.	
7	2.44E+05	87 0.	1316 0.		
9	0.	106 0.	1622 0.	FPT -49.4C	
11	0.	126 0.	1927 0.		
12	0.	146 0.	2233 0.	TAS (M/S)	
14	2.44E+05	169 0.	2538 0.	138.64	
16	0.	189 0.	2843 0.		
18	0.	209 0.	3149 0.	2 1.37E-05	
19	0.	230 0.	3454 0.		
21	0.	250 0.	3760 0.	FORM F1.00	
23	0.	271 0.	4065 0.	NT(N/M <sup>3</sup> )	
25	0.	291 0.	4370 0.	2.7511E-01	
27	0.	311 0.	4676 0.		
IMC	3.05E-05	0.	1.02E-06	TOTALS	
4ED 0	2	0	191	1.02E-06	191

IMC 3.05E-05 0. 1.02E-06 191  
4ED 0 2 0 191

AFNL CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18135130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	ALT (KM)
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	278.03	9.67
2	2.54E+09	26 1.0E+04	437 1.76E+08		
3	1.43E+08	47 1.63E+04	706 2.84E+08		
5	7.32E+05	67 0.	1011 0.	T -49.57C	
7	7.32E+05	87 0.	1316 0.		
9	1.46E+06	106 3.13E+03	1622 0.	FPT -49.4C	
11	1.47E+06	126 3.10E+03	1927 0.		
12	2.44E+05	146 1.15E+03	2233 0.	TAS (M/S)	
14	7.32E+05	169 2.71E+03	2538 0.	138.85	
16	7.32E+05	189 0.	2843 0.		
18	7.32E+05	209 0.	3149 0.	2 7.94E-04	
19	7.32E+05	230 0.	3454 0.		
21	2.44E+05	250 0.	3760 0.	FORM F 1.5	
23	0.	271 0.	4065 0.	NT(N/M <sup>3</sup> )	
25	0.	291 0.	4370 0.	6.6117E-02	
27	0.	311 0.	4676 0.		
IMC	4.39E-05	4.35E-05	1.49E-05	TOTALS	
4ED 0	2	55	301	5.85E-05	61

IMC 4.39E-05 4.35E-05 1.49E-05 301  
4ED 0 2 55 301

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1813100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.54E+09	26	0.	437	9.67	277.05
3	1.54E+08	47	0.	706		
5	1.65E+06	67	0.	1011	-49.53C	
7	1.94E+06	87	0.	1116	FPT -49.4C	
9	0.	108	1.54E+02	1422		
11	4.84E+05	128	0.	1927	TAS (M/S)	
12	2.41E+05	148	0.	2233	146.12	
14	0.	169	0.	2538		
16	2.42E+05	189	0.	2843	Z 4.08E-02	
18	0.	209	0.	3149		
19	2.42E+05	230	0.	3454	FORM F .55	
21	0.	250	0.	3760		
23	0.	271	0.	4065	NT(N/M**3)	
25	0.	291	0.	4370	6.5659E+01	
27	0.	311	0.	4676		
IMC	3.54E-05		3.21E-06		TOTALS	
4ED 0	2		58		4.71E-04	
					110	317

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18130130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.55E+09	26	0.	437	9.67	277.98
3	1.56E+08	47	0.	706		
5	7.26E+05	67	0.	1011	-49.53C	
7	4.85E+05	87	0.	1116	FPT -49.4C	
9	7.27E+05	108	0.	1622		
11	0.	128	0.	1927	TAS (M/S)	
12	4.86E+05	148	0.	2233	139.75	
14	7.28E+05	169	0.	2538		
16	0.	189	0.	2843	Z 1.59E-02	
18	4.85E+05	209	0.	3149		
19	0.	230	0.	3454	FORM F .85	
21	0.	250	0.	3760		
23	0.	271	0.	4065	NT(N/M**3)	
25	0.	291	0.	4370	1.9136E+01	
27	2.43E+05	311	0.	4676		
IMC	4.24E-05		0.		TOTALS	
4ED 0	2		0.		2.45E-04	
					311	311

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1813100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.46E+09	26	6.17E+04	1.57E+01	9.67	277.76
3	1.54E+08	47	8.13E+03	2.54E+01		
5	1.79E+06	67	0.	0.	-49.44C	
7	1.94E+06	87	1.36E+04	0.	FPT -49.4C	
9	1.94E+06	108	1.08E+04	0.		
11	1.46E+06	128	0.	1927	TAS (M/S)	
12	7.28E+05	148	9.09E+02	2233	139.60	
14	7.28E+05	169	0.	2538		
16	2.42E+05	189	0.	2843	Z 6.99E-03	
18	9.71E+05	209	0.	3149		
19	2.42E+05	230	0.	3454	FORM F .16	
21	2.42E+05	250	0.	3760		
23	0.	271	0.	4065	NT(N/M**3)	
25	0.	291	0.	4370	6.9224E+02	
27	0.	311	0.	4676		
IMC	5.07E-05		5.59E-05	1.34E-04	TOTALS	
4ED 0	3		53	301	1.89E-04	
					270	

AFML CIRRUS STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 1813133

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.45E+09	26	0.	437	9.67	277.79
3	1.40E+08	47	0.	706		
5	1.23E+06	67	0.	1011	-49.52C	
7	1.94E+06	87	2.26E+03	1316	FPT -49.4C	
9	4.84E+05	108	0.	1622		
11	2.42E+05	128	0.	1927	TAS (M/S)	
12	4.84E+05	148	0.	2233	139.92	
14	0.	169	0.	2538		
16	4.84E+05	189	0.	2843	Z 3.10E-02	
18	2.42E+05	209	0.	3149		
19	0.	230	0.	3454	FORM F .45	
21	0.	250	0.	3760		
23	0.	271	0.	4065	NT(N/M**3)	
25	0.	291	0.	4370	7.2512E+01	
27	0.	311	0.	4676		
IMC	3.49E-05		3.12E-06	3.58E-04	TOTALS	
4ED 0	2		50	316	3.61E-04	
					315	

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 ON 5 APR 78 10 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18139100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRECIP	ALT	PRESS (MB)
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	(KM)	(MB)
2	2.71E+09	26	1.10E+04	3.50E+00	9.66	278.00
3	1.47E+08	47	0.	5.65E+00		
5	0.	67	3.83E+03	0.	-49.64C	
7	2.44E+05	87	0.	0.		
9	2.44E+05	108	0.	0.	FPT -49.4C	
11	0.	128	0.	0.		
12	2.43E+05	148	0.	0.	TAS (M/S)	
14	0.	169	0.	0.	139.11	
16	4.88E+02	189	0.	0.		
18	2.43E+05	209	0.	0.	Z 1.55E-03	
19	0.	230	0.	0.		
21	0.	250	0.	0.	FORM F .20	
23	0.	271	0.	0.	NTIN/M**3	
25	0.	291	0.	0.	8.4514E+01	
27	0.	311	0.	0.		
IMC 3.57E-05				2.97E-05	TOTALS	
MED 0				26	3.68E-05	284

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 ON 5 APR 78 10 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18139130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRECIP	ALT	PRESS (MB)
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	(KM)	(MB)
2	2.74E+09	26	0.	4.97E+00	9.67	277.90
3	1.55E+08	47	0.	8.01E+00		
5	2.44E+05	67	0.	0.	-49.85C	
7	2.44E+05	87	0.	0.		
9	2.44E+05	108	0.	0.	FPT -49.4C	
11	0.	128	0.	0.		
12	0.	148	0.	0.	TAS (M/S)	
14	0.	169	0.	0.	139.05	
16	0.	189	0.	0.		
18	0.	209	0.	0.	Z 2.26E-03	
19	0.	230	0.	0.		
21	0.	250	0.	0.	FORM F .91	
23	0.	271	0.	0.	NTIN/M**3	
25	0.	291	0.	0.	3.9968E+08	
27	0.	311	0.	0.		
IMC 3.27E-05				4.22E-05	TOTALS	
MED 0				301	4.22E-05	301

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 ON 5 APR 78 10 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18140100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRECIP	ALT	PRESS (MB)
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	(KM)	(MB)
2	2.87E+09	26	0.	2.94E-01	9.68	277.44
3	1.56E+08	47	0.	4.75E-01		
5	0.	67	0.	0.	-50.29C	
7	2.45E+05	87	0.	0.		
9	0.	108	0.	0.	FPT -49.4C	
11	0.	128	0.	0.		
12	0.	148	0.	0.	TAS (M/S)	
14	0.	169	0.	0.	138.28	
16	0.	189	0.	0.		
18	0.	209	0.	0.	Z 1.30E-04	
19	0.	230	0.	0.		
21	0.	250	0.	0.	FORM F .91	
23	0.	271	0.	0.	NTIN/M**3	
25	0.	291	0.	0.	2.1318E-01	
27	0.	311	0.	0.		
IMC 3.36E-05				2.50E-06	TOTALS	
MED 0				301	2.50E-06	301

AFML CIRRUS STUDY BY AFGL  
FLIGHT 178-17 ON 5 APR 78 10 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18140130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRECIP	ALT	PRESS (MB)
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	(KM)	(MB)
2	2.86E+09	26	0.	2.96E-01	9.68	277.41
3	1.57E+08	47	0.	4.77E-01		
5	0.	67	0.	0.	-50.41C	
7	0.	87	0.	0.		
9	0.	108	0.	0.	FPT -49.4C	
11	0.	128	0.	0.		
12	0.	148	0.	0.	TAS (M/S)	
14	0.	169	0.	0.	137.64	
16	0.	189	0.	0.		
18	0.	209	0.	0.	Z 1.31E-04	
19	0.	230	0.	0.		
21	0.	250	0.	0.	FORM F .91	
23	0.	271	0.	0.	NTIN/M**3	
25	0.	291	0.	0.	2.1403E-01	
27	0.	311	0.	0.		
IMC 3.35E-05				2.51E-06	TOTALS	
MED 0				301	2.51E-06	301

AFML CIRRUS STUDY 9V AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18142100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.79E+09	26	0.	437	5.04E+01	277.50
3	1.67E+08	47	0.	706	0.13E+01	
5	0.	67	0.	1011	0.83E+00	T -49.80C
7	0.	87	0.	1316	6.71E+00	FPT -49.4C
9	0.	108	0.	1622	5.45E+01	TAS (M/S)
11	0.	128	0.	1927	0.	139.08
12	0.	148	0.	2233	0.	
14	0.	169	0.	2538	0.	Z 1.40E-01
16	0.	189	0.	2843	0.	FORM F .63
18	0.	209	0.	3149	0.	NT(N/M**3)
19	0.	230	0.	3454	0.	4.1398E+01
21	0.	250	0.	3760	0.	TOTALS
23	0.	271	0.	4065	0.	
25	0.	291	0.	4370	0.	
27	0.	311	0.	4676	0.	
IMC	7.3E-05	0.	0.	7.8E-04		
4ED D	2			364		

AFML CIRRUS STUDY 9V AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18142100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.89E+09	26	0.	437	1.21E+00	277.54
3	1.58E+08	47	0.	706	0.	
5	0.	67	0.	1011	0.	T -50.33C
7	0.	87	0.	1316	0.	FPT -49.4C
9	2.49E+05	108	0.	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	136.62
12	0.	148	0.	2233	0.	
14	0.	169	0.	2538	0.	Z 1.39E-05
16	0.	189	0.	2843	0.	FORM F1.0
18	0.	209	0.	3149	0.	NT(N/M**3)
19	0.	230	0.	3454	0.	2.0058E-01
21	0.	250	0.	3760	0.	TOTALS
23	0.	271	0.	4065	0.	
25	0.	291	0.	4370	0.	
27	0.	311	0.	4676	0.	
IMC	3.33E-05	0.	0.	1.04E-06		
4ED D	2			191		

AFML CIRRUS STUDY 9V AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18142130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.83E+09	26	0.	437	3.74E+02	277.62
3	1.54E+08	47	0.	706	6.03E+02	
5	0.	67	0.	1011	9.72E+01	T -49.74C
7	0.	87	0.	1316	6.94E+01	FPT -49.4C
9	0.	108	0.	1622	4.01E+01	TAS (M/S)
11	0.	128	0.	1927	7.70E+01	140.81
12	0.	148	0.	2233	0.	
14	0.	169	0.	2538	0.	Z 6.53E+00
16	0.	189	0.	2843	6.97E-01	FORM F .48
18	0.	209	0.	3149	0.	NT(N/M**3)
19	0.	230	0.	3454	0.	3.4238E+02
21	0.	250	0.	3760	0.	TOTALS
23	0.	271	0.	4065	0.	
25	0.	291	0.	4370	0.	
27	0.	311	0.	4676	0.	
IMC	3.32E-05	0.	0.	1.10E-02		
4ED D	2			595		

AFML CIRRUS STUDY 9V AFGL  
FLIGHT E78-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18142130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)					PRESS (MB)	
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	ALT (KM)	
2	2.89E+09	26	0.	437	7.15E+00	277.60
3	1.63E+08	47	0.	706	0.	
5	0.	67	0.	1011	0.	T -49.96C
7	0.	87	0.	1316	0.	FPT -49.4C
9	0.	108	0.	1622	0.	TAS (M/S)
11	0.	128	0.	1927	0.	137.74
12	0.	148	0.	2233	0.	
14	0.	169	0.	2538	0.	Z 8.23E-05
16	0.	189	0.	2843	0.	FORM F1.00
18	0.	209	0.	3149	0.	NT(N/M**3)
19	0.	230	0.	3454	0.	1.6564E+00
21	0.	250	0.	3760	0.	TOTALS
23	0.	271	0.	4065	0.	
25	0.	291	0.	4370	0.	
27	0.	311	0.	4676	0.	
IMC	3.41E-05	0.	0.	6.11E-06		
4ED D	2			191		

AFML CIRCUIT STUDY BY AFGL  
FLIGHT E78-17 ON 5 APR 78 38 SECOND. AVERAGING  
TYPE: GULL-ROSE INTERVAL START: 10144100

SIZE (MU)	PARTICLE SIZE SCATTER PROBE	DISPER- SION (MU)	STRENGTH CLOUD PROBE	NUMBER/M <sup>3</sup> -MM SIZE PROBE	PRESS (MM) 277.00
2	2.01E+09	26	0.	2.74E+02	ALT 9.67
3	1.63E+08	47	0.	4.53E+02	
5	4.03E+05	67	0.	6.72E+01	T -49.71C
7	0.	87	0.	4.39E+01	FPT -49.4C
9	0.	108	0.	2.02E+01	
11	0.	128	0.	1.927	TAS (M/S)
12	0.	146	0.	2.233	140.34
14	0.	169	0.	0.23E+00	
16	0.	189	0.	2538	
18	0.	209	0.	2843	
19	0.	230	0.	3149	2 3.36E+00
21	0.	250	0.	3454	FORM F .48
23	0.	271	0.	3760	
25	1.	291	0.	4065	INT(N/MM <sup>3</sup> )*2
27	0.	311	0.	4676	2.4319E+02

PARTICLE SIZE DISTRIBUTIONS (NUMBER/CM <sup>3</sup> -MM)				PRESS (MMB)
SIZE (MU)	SCATTER PROBE	CLOUD PROBE	PRECIP PROBE	270.28
2	3.02E+09	26	437	ALT
3	1.77E+08	47	706	9.66
5	0.	67	1041	T
7	0.	87	1316	-50.09C
9	0.	198	1422	FPT
11	0.	128	1927	-49.4C
12	0.	140	2333	TAS
14	0.	169	2748	(M/S)
16	0.	189	2843	133.61
18	0.	209	3149	Z
19	0.	230	3454	0.
21	6.	257	3760	FORM
23	0.	271	4065	F0.00
25	0.	291	4370	NT(N/HEAT)
27	0.	311	4676	0.

INC	3.35E-05	0.	7.23E-03	TOTALS
VED D	2	0	544	544

ITEM	QTY	UNIT PRICE	TOTALS
1. 3.60E-05	2	0.	0.
2. 1.00E-05	2	0.	0.
3. 1.00E-05	2	0.	0.
4. 1.00E-05	2	0.	0.
5. 1.00E-05	2	0.	0.
6. 1.00E-05	2	0.	0.
7. 1.00E-05	2	0.	0.
8. 1.00E-05	2	0.	0.
9. 1.00E-05	2	0.	0.
10. 1.00E-05	2	0.	0.
11. 1.00E-05	2	0.	0.
12. 1.00E-05	2	0.	0.
13. 1.00E-05	2	0.	0.
14. 1.00E-05	2	0.	0.
15. 1.00E-05	2	0.	0.
16. 1.00E-05	2	0.	0.
17. 1.00E-05	2	0.	0.
18. 1.00E-05	2	0.	0.
19. 1.00E-05	2	0.	0.
20. 1.00E-05	2	0.	0.
21. 1.00E-05	2	0.	0.
22. 1.00E-05	2	0.	0.
23. 1.00E-05	2	0.	0.
24. 1.00E-05	2	0.	0.
25. 1.00E-05	2	0.	0.
26. 1.00E-05	2	0.	0.
27. 1.00E-05	2	0.	0.
28. 1.00E-05	2	0.	0.
29. 1.00E-05	2	0.	0.
30. 1.00E-05	2	0.	0.
31. 1.00E-05	2	0.	0.
32. 1.00E-05	2	0.	0.
33. 1.00E-05	2	0.	0.
34. 1.00E-05	2	0.	0.
35. 1.00E-05	2	0.	0.
36. 1.00E-05	2	0.	0.
37. 1.00E-05	2	0.	0.
38. 1.00E-05	2	0.	0.
39. 1.00E-05	2	0.	0.
40. 1.00E-05	2	0.	0.
41. 1.00E-05	2	0.	0.
42. 1.00E-05	2	0.	0.
43. 1.00E-05	2	0.	0.
44. 1.00E-05	2	0.	0.
45. 1.00E-05	2	0.	0.
46. 1.00E-05	2	0.	0.
47. 1.00E-05	2	0.	0.
48. 1.00E-05	2	0.	0.
49. 1.00E-05	2	0.	0.
50. 1.00E-05	2	0.	0.
51. 1.00E-05	2	0.	0.
52. 1.00E-05	2	0.	0.
53. 1.00E-05	2	0.	0.
54. 1.00E-05	2	0.	0.
55. 1.00E-05	2	0.	0.
56. 1.00E-05	2	0.	0.
57. 1.00E-05	2	0.	0.
58. 1.00E-05	2	0.	0.
59. 1.00E-05	2	0.	0.
60. 1.00E-05	2	0.	0.
61. 1.00E-05	2	0.	0.
62. 1.00E-05	2	0.	0.
63. 1.00E-05	2	0.	0.
64. 1.00E-05	2	0.	0.
65. 1.00E-05	2	0.	0.
66. 1.00E-05	2	0.	0.
67. 1.00E-05	2	0.	0.
68. 1.00E-05	2	0.	0.
69. 1.00E-05	2	0.	0.
70. 1.00E-05	2	0.	0.
71. 1.00E-05	2	0.	0.
72. 1.00E-05	2	0.	0.
73. 1.00E-05	2	0.	0.
74. 1.00E-05	2	0.	0.
75. 1.00E-05	2	0.	0.
76. 1.00E-05	2	0.	0.
77. 1.00E-05	2	0.	0.
78. 1.00E-05	2	0.	0.
79. 1.00E-05	2	0.	0.
80. 1.00E-05	2	0.	0.
81. 1.00E-05	2	0.	0.
82. 1.00E-05	2	0.	0.
83. 1.00E-05	2	0.	0.
84. 1.00E-05	2	0.	0.
85. 1.00E-05	2	0.	0.
86. 1.00E-05	2	0.	0.
87. 1.00E-05	2	0.	0.
88. 1.00E-05	2	0.	0.

FLIGHT E78-17 CN 5 APR 78 AFWL CIRQUE STUDY 9V AFGL  
TYPE: BULL-ROSE 30 SECOND AVERAGING  
INTERVAL START: 10164130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/CM <sup>3</sup> -NM)			PRESS (MMB)	
SIZE (UM)	SCATTER PROBE	SIZE (UM)	PROBE	PRECIP
2	2.90E+09	26	0.	2.24E+01
4	1.50E+08	47	0.	3.61E+01
5	0.	67	0.	1011
7	0.	87	0.	5.91E+00
9	0.	108	0.	3.63E+00
11	0.	126	0.	1.62E+00
12	0.	148	0.	1.16E+00
14	0.	169	0.	2.33
16	0.	189	0.	2.78
18	0.	209	0.	2.84
19	0.	230	0.	3.19
21	0.	250	0.	3.84
23	0.	271	0.	4.66
25	0.	311	0.	4.37
27	0.	391	0.	4.67

SIZE (MU)	PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)		PRESS (MMB)
	SCATTER PROBE	SIZE PROBE	
2	2.95E+09	26	0.
3	1.60E+08	4	0.
5	0.	67	0.
7	0.	87	0.
9	0.	108	0.
11	0.	120	0.
12	0.	140	0.
14	0.	169	0.
16	0.	189	0.
18	0.	209	0.
19	0.	230	0.
21	0.	250	0.
23	0.	271	0.
25	0.	291	0.
27	0.	311	0.

INC	3.45E-05	0.	0	
MEQ	0	2	0	
				6.21E-04
				sec
				TOTALS
				6.21E-04
				sec

2.69E-05	0.	0	TOTALS
301			2.69E-05
2			301
3.55E-05			
2			
2.69E-05			
301			

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18145100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	2.85E+09	26	0.	1.16E+00	9.44
3	1.72E+08	47	0.	0.	9.23
5	2.35E+05	67	0.	0.	T -48.09C
7	0.	87	0.	0.	FPT -49.4C
9	0.	108	0.	0.	TAS (M/S)
11	0.	128	0.	0.	144.22
12	0.	148	0.	0.	2 1.33E-05
14	0.	169	0.	0.	FORM F1.0J
15	0.	189	0.	0.	NT(N/M**3)
16	0.	209	0.	0.	2.6309E-01
18	0.	230	0.	0.	
19	0.	250	0.	0.	
21	0.	271	0.	0.	
23	0.	291	0.	0.	
25	0.	311	0.	0.	
27	0.				
TOTALS				9.85E-07 191	
INC	3.42E-05	0.	0.	9.85E-07	191
4ED 0	2				

TOTALS 9.85E-07 191

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18145130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	2.85E+09	26	0.	0.	9.35
3	1.53E+08	47	0.	0.	9.23
5	0.	67	0.	0.	T -47.62C
7	0.	87	0.	0.	FPT -49.4C
9	0.	108	0.	0.	TAS (M/S)
11	0.	128	0.	0.	144.55
12	0.	148	0.	0.	2 0.
14	0.	169	0.	0.	FORM F0.00
15	0.	189	0.	0.	NT(N/M**3)
16	0.	209	0.	0.	0.
18	0.	230	0.	0.	
19	0.	250	0.	0.	
21	0.	271	0.	0.	
23	0.	291	0.	0.	
25	0.	311	0.	0.	
27	0.				
TOTALS				0. 0.	
INC	3.39E-05	0.	0.	0.	0.
4ED 0	2				

TOTALS 0. 0.

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18145100

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	2.76E+09	26	0.	0.	9.23
3	1.42E+08	47	0.	0.	T -48.49C
5	0.	67	0.	0.	FPT -49.4C
7	0.	87	0.	0.	TAS (M/S)
9	0.	108	0.	0.	147.36
11	0.	128	0.	0.	2 0.
12	0.	148	0.	0.	FORM F0.00
14	0.	169	0.	0.	NT(N/M**3)
15	0.	189	0.	0.	0.
16	0.	209	0.	0.	
18	0.	230	0.	0.	
19	0.	250	0.	0.	
21	0.	271	0.	0.	
23	0.	291	0.	0.	
25	0.	311	0.	0.	
27	0.				
TOTALS				0. 0.	
INC	3.19E-05	0.	0.	0.	0.
4ED 0	2				

TOTALS 0. 0.

AFML CIRRUS STUDY 9Y AFGL  
FLIGHT 678-17 ON 5 APR 78 30 SECOND AVERAGING  
TYPE: BULL-ROSE INTERVAL START: 18145130

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M <sup>3</sup> -MM)				PRESS (MB)	
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	PRECIP PROBE	ALT (KM)
2	2.85E+09	26	0.	0.	9.13
3	1.61E+08	47	0.	0.	T -45.79C
5	0.	67	0.	0.	FPT -49.4C
7	0.	87	0.	0.	TAS (M/S)
9	0.	108	0.	0.	149.26
11	0.	128	0.	0.	7 0.
12	0.	148	0.	0.	FORM F0.00
14	0.	169	0.	0.	NT(N/M**3)
15	0.	189	0.	0.	0.
16	0.	209	0.	0.	
18	0.	230	0.	0.	
19	0.	250	0.	0.	
21	0.	271	0.	0.	
23	0.	291	0.	0.	
25	0.	311	0.	0.	
27	0.				
TOTALS				0. 0.	
INC	3.36E-05	0.	0.	0.	0.
4ED 0	2				

TOTALS 0. 0.

## Appendix E

### List of Abbreviations

1.	AFB	Air Force Base
2.	AFGL	Air Force Geophysics Laboratory
3.	AFWL	Air Force Weapons Laboratory
4.	Alt	Altitude (above mean sea level unless otherwise specified)
5.	ART	Airborne Radiation Technology
6.	ASSP	Axial Scattering Spectrometer Probe
7.	Bkn	Cloud cover 5/8 to 7/8 (broken)
8.	C	Cloud (or droplet) probe
9.	°C	Temperature in Degrees Celsius (C on computer listings)
10.	Ci	Cirrus
11.	Cs	Cirrostratus
12.	FPT	Frostpoint
13.	GOES	Geostationary Operational Environmental Satellite
14.	$\text{g m}^{-3}$	Grams per cubic meter
15.	Hdg	Aircraft heading
16.	IAS	Indicated air speed
17.	IWC	Ice water content
18.	LWC	Liquid water content
19.	mb	Millibar (MB on computer listings)
20.	$\mu\text{m}$	Micron ( $= 10^{-6}$ meter) [MU on computer listings]
21.	MSL	Mean sea level



22.	OAT	Outside air temperature
23.	1-D	One-dimensional Particle Measuring System
24.	OVC	Cloud cover 8/8 (overcast)
25.	P	Precipitation Probe
26.	Sct	Cloud cover 1/8 to 3/8 (scattered)
27.	T	Temperature
28.	TAS	True air speed
29.	2-D	Two-dimensional Particle Measuring System
30.	Z	Universal (or Greenwich) mean time
31.	Z	[Calculated radar reflectivity on computer listings]